IBM Systems Reference Library

Catalog of Programs for IBM 1130

Computer System and IBM 1800

Data Acquisition and Control System

December 1966

This Catalog contains a complete listing of
all programs available for the IBM 1130
Computer System and IBM 1800 Data Acquisition
and Control System.

Instructions for ordering magnetic tape programs
are contained in the section of the Introduction
entitled, "How to Order Programs".

This Catalog contains the following sections:

1. Introduction and instructions on how to
   use the catalogs and how to order the
   programs.

2. A list of corrections and revisions to
   announced programs (if applicable).

3. A Keyword-in-Context (KWIC) Index.

4. Abstracts of all available programs.

5. A list of deletions (if applicable).

All programs listed in this Catalog should
be ordered through your local IBM Branch Office.

TABLE CF CCNTENTS

INTRODUCTION

The Catalogs for the systems listed below, with their form numbers, are currently available from IBM Branch Offices. Individually updated supplemental issues of all Catalogs will be published under the form numbers indicated and can be obtained from IBM Branch Offices as they are published.

Title	Catalog Form No.	Supplement Form No.
Catalog of Programs for IBM 305 and 650 Data Processing Systems	C20-1600	N20-0012
Catalog of Programs for IBM 1240, 1401, 1420, 1440, and 1460 Data Processing Systems	C20-1601	N20-0013
Catalog of Programs for IBM 705, 1410, 7010, 7070, 7072, 7074, 7080, 7740 and 7750 Data Processing Systems	C20-1602	N20-0014
Catalog of Programs for IBM 1620 and 1710 Data Processing Systems	C20-1603	N20-0015
Catalog of Programs for IBM 704, 709, 7040, 7044, 7090 and 7094 Data Processing Systems	C20-1604	N20-0016
Catalog of Programs for IBM System/360	C20-1619	N20-0030
Catalog of Programs for IBM 1130 Computer System and IBM 1800 Data Acquisition and Control System	C20-1630	N20-0031

This Catalog contains a complete listing of all programs available for the IBM 1130 Computer System and the IBM 1800 Data Acquisition and Control System.

To assist you further in using this Catalog, the abstracts are listed by file number in numeric and alphabetical sequence.

TYPES OF PROGRAMS

Type I

Programming Systems are conceived and developed by IBM as integral parts of the data processing system for which they are written.

Type II

Application Programs are carefully selected solutions by IBM of data processing problems. They are supported by well-planned documentation and tested procedures.

Both types of programs are maintained by IBM and modifications will be supplied automatically to all users of specific programs by the Program Information Department. Abstracts for Type I and Type II programs are contained in the "IBM Programs" Section of this Catalog.

Type III

IBM-Contributed Programs are contributed voluntarily by IBM employees to aid the programming and system community.

Type IV

Customer-Contributed Programs are valuable aids to the programming and systems community supplied by members of customer organizations and individual users of IBM Data Processing Systems.

IBM serves solely as the distribution agent for Type III and Type IV programs. Abstracts for Type III and Type IV programs are contained in the "Contributed Programs" Section of this Catalog.

CUSTOMER ORGANIZATIONS

Customer organizations take part in the exchange of programming and systems information.

COMMON is an organization of users of IBM 1620, 1710, 1130, 1800 and System/360 Data Processing Systems.

Through the discussion of programming and operational techniques, and the establishment of standards for communicating programming information, this organization directs itself to more profitable utilization of IBM Data Processing Systems installed within the membership.

To obtain information regarding membership contact your IBM Representative.

STANDARDS FOR TYPE IV (CUSTOMER CONTRIBUTED) PROGRAMS

Programs written by customer personnel must conform to established standards and procedures. These criteria differ according to the machine system for which the program is written. Copies of standards and procedures for Type IV (Customer Contributed) Programs are available through your local IBM Branch Office.

HOW TO ORDER PROGRAMS

Domestic Customers

All Programs listed in this Catalog should be ordered through your local IBM Branch Office.

Magnetic tapes will be duplicated at 800 characters per inch unless a different density is specified by the requestor. A full reel of tape, containing 2400 feet, should be submitted. Be sure to check the abstract for the exact number of tapes required when requesting a magnetic tape program.

The Program Information Department's objective is to complete the in-house processing of a program request within ten (10) working days of its receipt by the department.

IBM World Trade Customers

World Trade customers should order programs by contacting their IBM representative.

KEYWORD-IN-CONTEXT INDEX

The Keyword-in-Context Index lists available programs arranged alphabetically by the keywords in the program titles. There is an index entry for each significant keyword in the title. Certain words are not accepted as indexing words but will be printed as part of the title.

This KWIC Index was prepared by highlighting each keyword of the title in the context of words on either side of it and aligning the keywords of all titles alphabetically in a vertical column. The following example will illustrate the operation:

Notice that the # sign always precedes the first word of the title. A title that is longer than 59 characters will show only the characters that fall on either side of the keyword being highlighted, up to the limits of one line. The complete title may be found in the Abstract section. The slash (/) is used in place of parentheses. The # placed two spaces in front of the first word indicates that the entry is the second part of a two-line title.

PROGRAM CLASSIFICATION CODES

Included below is a complete listing of classification codes for all types of programs and for each system included in this Catalog.
In addition to assisting you in locating the abstract of each program, this list should prove useful in classifying programs written by IBM or customer personnel and contributed to the program libraries.

Programming Systems Type I

/AS/	Assembly Systems
/CB/	COBOL - Common Bus. Oriented Language
/CL/	Control Programs
/CQ/	Communications Input/Output
/CV/	Conversion Programs
/DC/	Diagnostic
/DM/	Data Management
/DN/	Diagnostic Programs
/ED/	Editor
/EU/	Emulator Programs
/FO/	FORTRAN - Formula Translation
/IO/	Input/Output
/LD/	Loader
/LM/	Library Material
/MI/	Miscellaneous
/OS/	Operating Systems
/PL/	Programming Language/I Compiler
/PT/	Program Testing Aids
/RC/	Remote Computing
/RG/	Report Generators
/SI/	Simulator Programs
/SM/	Sort/Merge
/SV/	Supervisory Systems
/UT/	Utility Programs

Application Programs Type II

Industry-Oriented Programs

Distribution

/DP/	Publishing
/DR/	Retail
/DW/	Wholesale
/DX/	Other

Finance

/FB/	Banking
/FF/	Finance Companies
/FI/	Brokerage and Investment
/FX/	Other

Federal Government

/GF/	Government, Federal

Insurance

/IB/	Blue Cross and Blue Shield
/IF/	Fire and Casualty
/IL/	Life
/IX/	Others

Manufacturing

/MA/	Aerospace
/ME/	Electrical and Machinery
/MD/	Drug, Food, Chemical Products
/MF/	Fabrication and Primary Metals
/MP/	Petroleum and Industrial Chemicals
/MR/	Transportation Equipment
/MT/	Textiles and Paper
/MX/	Other

Service

/SC/	Communications
/ST/	Transportation
/SU/	Utilities
/SX/	Other

Universities and Government

/UC/	Colleges and Universities
/UG/	Government, State and Local
/UH/	Hospital and Medical
/US/	Secondary Schools
/UX/	Other

Industry-Independent Programs

Cross Industry Group

/CA/	Statistical Applications
/CC/	Process Control
/CM/	Mathematical Applications
/CN	Numerical Control Applications
/CO/	Operations Research
/CP/	Critical Path Scheduling
/CR/	Information Retrieval
/CS/	Simulators
/CX/	Other

Engineering

/EC/	Civil Engineering
/EE/	Electrical Engineering
/EH/	Chemical Engineering
/EM/	Mechanical Engineering

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/EN/     Nuclear Codes
/EO/     Optics
/EX/     Other

Exploratory

/XP/     Mathematics and Applications

Type III and IV Programs

Utility (External) Programs  00.
    0 Unclassified
    1 Multiple Utility
    2 Flowcharting
    3 Tape Handling
    4 Disk Handling
    5 Drum and Direct Data Devices
    6 Graphic Display Devices

Utility (Internal) Programs  01.
    0 Unclassified
    1 Loading
    2 Clear/Reset memory
    3 Check Sum Accumulative and
      Correction
    4 Internal Housekeeping
    5 Dump to Reload
    6 File Organization

Diagnostics  02.
    0 Unclassified
    5 Status recorders

Programming Systems  03.
    0 Unclassified
    1 Assemblers
    2 Compilers
    3 Interpretive Systems
    4 Input/Output Control
    5 Report Generators
    6 Preprocessing and Editing

Testing and Debugging  04.
    0 Unclassified
    1 Dumping
    2 Tracing
    3 Test Data Preparation
    4 Testing Systems
    5 Break Point Printing
    6 Memory Verification and Searching

Executive Routines  05.
    0 Unclassified
    1 Monitor
    2 Supervisor
    3 Disassembly and Derelativizing
    4 Relativizing
    5 Relocation

Data Handling  06.
    0 Unclassified
    1 Sorting
    2 Merging
    3 Data Transmission
    4 Table Operations
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    5 Conversion and/or Scaling
    6 Character and Symbol Manipulation
    7 Information Classification and
      Retrieval
    8 List Processing

Input  07.
    0 Unclassified
    1 Binary
    2 Octal
    3 Decimal
    4 BCD
    5 Hexadecimal
    6 Composite

Output  08.
    0 Unclassified
    1 Binary
    2 Octal
    3 Decimal
    4 BCD
    5 Hexadecimal
    6 Plotting
    7 Display
    8 Composite

Elementary and Arithmetic Functions  09.
    0 Unclassified
    1 Floating Point Arithmetic
    2 Complex Arithmetic
    3 Roots and Powers
    4 Trigonometric
    5 Hyperbolic, Exponential and
      Logarithmic
    6 Geometry
    7 Interpolation, Curve Fitting and
      Smoothing
    8 Real and Decimal Numbers
    9 Logical and Rounded

Mathematical Routines  10.
    0 Unclassified
    1 Functional Subroutine
    2 Polynomial and Related Routines
    3 Numerical Integration
    4 Numerical Solutions of Differential
      Equations
    5 Matrix Operations
    6 Eigenvalues and Eigenvectors
    7 Determinants
    8 Simultaneous Linear and Non-Linear
      Equations
    9 Vector Analysis

Simulation  11.
    0 Unclassified
    1 Computers
    2 Peripheral Equipment
    3 System component or feature
    4 Pseudo-Computer

Conversion  12.
    0 Unclassified
    1 Data Conversion
    2 Computer Language Translators
```

Statistical 13.
    0 Unclassified
    1 Descriptive
    2 Univariate and Multivariate
      Parametric
    3 Non-Parametric
    4 Time Series and Auto Correlation
    5 Probability Distribution Sampling,
      and Random Number Generators
    6 Correlation and Regression Analysis
    7 Analysis of Variance and Covariance
    8 Sequential Analysis
    9 Discriminant Analysis

Management Science 15.
    0 Unclassified
    1 Simulations
    2 Linear Programming
    3 Non-linear Programming
    4 Scheduling
    5 Games, Game Like Models and Game
      Theory
    6 General Problem Solvers
    7 Inventory Control

Engineering .16.
    0 Unclassified
    1 Aeronautical
    2 Civil
    3 Chemical
    4 Electrical
    5 Mechanical and Hydraulic
    6 Petroleum
    7 Nuclear
    8 General

Sciences 17.
    0 Unclassified
    1 General Physics
    2 Nuclear Physics
    3 Chemistry
    4 Geology, Oceanography and Geophysics
    5 Biology
    6 Social and Behavioral
    7 Astronomy and Celestial Navigation

Nuclear Codes 18.
    0 Unclassified

Financial 19.
    0 Unclassified
    1 Investing and Borrowing
    2 Capital Stock
    3 Taxes
    4 Cash Custody and Forecasting
    5 General Accounting
    6 Auditing

Cost Accounting 20.
    0 Unclassified
    1 Material Only
    2 Labor Only
    3 Work in Progress

Payroll and Benefits 21.
    0 Unclassified
    1 Payroll
    2 Employee Benefits
    3 Profit Sharing
    4 Retirement
    5 Insurance
    6 Credit Union

Personnel 22.
    0 Unclassified
    1 Recruiting and Hiring
    2 Inventorying Employees
    3 Training
    4 Performance Review
    5 Administering Wages and Salary

Manufacturing 23.
    0 Unclassified
    1 Scheduling/Loading
    2 Job Reporting
    3 Bill of Materials Processors
    4 Numerical Control
    5 Control Systems

Quality Assurance/Reliability 24.
    0 Unclassified
    1 Testing
    2 Performance Analysis

Inventory – Raw and Finished and Equipment
           Tools
    0 Unclassified
    1 Stocking and Issuing
    2 Inventory Analysis
    3 Equipment Inventory and Maintenance

Purchasing 26.
    0 Unclassified
    1 Preparing Purchase Orders
    2 Matching Invoices
    3 Accounts Payable
    4 Purchase Analysis

Marketing 27.
    0 Unclassified
    1 Sales and Billings Forecasting
    2 Promotion and Advertising
    3 Bid or Request Analysis
    4 Distributor or Territory Analysis

Sales Entered and Billed 28.
    0 Unclassified
    1 Order Entry and Scheduling
    2 Invoicing
    3 Accounts Receivable
    4 Sales and Billing Analysis
    5 Backlog Reporting

General Services 29.
    0 Unclassified
    1 Records Retention
    2 Forms Management
    3 Standards
    4 Transportation
    5 Printing and Reproduction

Demonstrations 30.
    0 Unclassified
    1 Display
    2 Participation

Unclassified 31.
    0 Miscellaneous

USING THE CATALOG

To locate a program begin by thinking of the significant words describing the desired program. Then look in the KWIC, Keyword-in-Context, Index for the keyword entry. The page number adjacent to the file number will then direct you to the corresponding program abstract. The reference code is set up as follows:

System	File No.
1130	SP-001
1130	03.0.002

The number of the IBM System for which the program is written.	The IBM Library code for filing and ordering a program.

Now refer back to the illustration in the section entitled, "Keyword-in-Context Index". As you can see, the file numbers consist of an alphabetical and numeric reference.

    Type I and II program abstracts are located in the "IBM Programs" section of this Catalog; Type III and IV program abstracts are located in the "Contributed Programs" section.

    The page number listed at the end of the KWIC entry line will direct you to the program abstract. Each abstract describes the relevant program in enough detail to help you determine if the program will meet your requirements.

List of New Programs

This Section consists of a list of new Programs added since the last Supplement to the Catalog and a list of all Programs added since the last edition of the Catalog.

PROGRAM CORRECTIONS AND REVISION

There are two kinds of revisions to programs listed in this Catalog:
    1. Changes in the program abstract
    2. Functional changes in the program documentation and/or changes in the card decks and tapes.

Abstract changes for all Types of programs are noted in this catalog and in the Supplement. The following codes appear at the extreme right-end of the title line for each abstract that is new or has been revised in this edition:
    *N - This symbol indicates a new program
    *M - This symbol indicates that the title of the program has been modified when it appears only at the extreme right end of the title line.
    *M - This symbol indicates that the text of the abstract has been modified when an additional *M or * alone appears, at the extreme right end of each line of the abstract that has been modified.
    *R - This symbol indicates that the entire text of the abstract has been revised.

    Functional changes in program documentation and/or decks or tapes for Type III (IBM Contributed) and Type IV (Customer Contributed) programs are listed in a special table preceding the KWIC Index. This data is listed under three headings: program number; machine system area; and the date the correction was effective. If a user has received the program data prior to the date indicated and would like to receive the correction, he must reorder the program. See the section entitled, "How to Order Programs".

    Information concerning functional changes in program documentation and/or decks or tapes for Type I (Programming Systems) and Type II (Application Programs) can be obtained through your IBM Branch Office.

DELETED PROGRAMS

This section contains a list of programs that have been removed. These programs are listed in sequence by machine systems and file number.

    Included in the listing is an alphabetical heading, "Reason for Removal". This letter refers to a key that indicates the specific reasons for removing the program from the Catalog.

Alphabetical Key to Reason for Removal

A - This Program has been deleted because of low usage.
C - This program has been deleted because of limited usefulness.
D - This program is obsoleted and replaced by file number -------.
E - This program has been withdrawn by the COMMON organization.

F - This program has been withdrawn by
    the author.
    Programs deleted by the letter "D"
are followed by a file number code. This
code is the file number of the program
that replaces the deleted program.
    An abstract for the replacement
program may be found in the "Abstracts
of Available Programs" Sections in this
Catalog.

LIST CF PRCGRAM CCRRECTICNS & REVISICNS

PRCGRAM NUMEER	MACHINE AREA	CATE
16.2.C02	113C	11-15-66

LIST OF NEW PROGRAMS

CONTRIBUTED PROGRAMS

WORDS PREVENTED FROM INDEXING

For the purpose of this index the following words are considered to be too general to be useful for retrieval purposes and are therefore prevented from indexing. This list may be modified as needed to make the index more useful. Note that hyphenated words are treated as one index word, with only the first word being significant.

A
ABOUT
ABOVE
ACCOMPANYING
ACCORDING
ACHIEVED
ACHIEVEMENTS
ACHIEVES
ACQUIRED
ACROSS
ADAPTATION
ADDITIONAL
ADVANTAGE
ADVANTAGES
AFFECT
AFFECTED
AFFECTING
AFFORDING
AFTER
AGAIN
AGAINST
AIMED
ALL
ALLEGED
ALLOW
ALLOWED
ALLOWING
ALLOWS
ALMOST
ALONE
ALONG
ALSO
AMONG
AN
ANALYSES
ANALYSIS
ANALYZING
AND
AND/OR
ANOTHER
ANY
APART
APPARENT
APPARENTLY
APPEAR
APPEARING
APPLICABILITY
APPLICABLE
APPLICATION
APPLICATIONS
APPLIED
APPLY
APPLYING
APPRECIABLE
APPROACH
APPROACHES
APPROACHING
ARE
ARISE
ARISING
AROUND
AS
ASCERTAIN
ASPECT
ASPECTS
AT
ATTAIN
ATTAINED
ATTEMPT
ATTEMPTED
ATTEMPTS
AVAILABILITY
AVAILABLE
AVOIDING
AWAY
B
BAD
BASED
BASIC
BE
BECAUSE
BEEN

BEFORE
BEING
BELONG
BELOW
BEST
BETTER
BETWEEN
BEYOND
BIG
BOTH
BRIEF
BRIEFLY
BRING
BUT
BY
C
CALLED
CAN
CAPABILITIES
CAPABILITY
CAPABLE
CAUSE
CAUSED
CAUSES
CAUSING
CERTAIN
CHALLENGE
CHIEF
CO
COME
COMING
COMPANIES
COMPANY
COMPLETE
COMPLETED
COMPLETELY
COMPRISING
CONCERNED
CONCERNING
CONSIDERATION
CONSIDERATIONS
CONSIDERED
CONSIDERING
CONSISTING
CONVENIENT
CORP
CORPORATION
COULD
CPS
D
DATA
DE
DEG
DEPARTMENT
DEPARTMENTS
DEPENDING
DEPT
DETERMINATION
DETERMINE
DETERMINED
DETERMINING
DI
DID
DISCUSSION
DO
DOES
DOING
DONE
DOUBLE
DOUBLY
DOWN
DR
DUE
DURING
E
EACH
EARLIER
EARLY
EASE
EASILY
EASY

EIGHT
EITHER
ENG
ET
ETC
EXPLANATION
EXTREMELY
F
FAR
FAST
FEW
FEWER
FIFTH
FINAL
FIRST
FIVE
FOR
FOUR
FOURTEEN
FOURTH
FROM
FT
FULL
FULLY
FUNDAMENTALS
FURTHER
G
GAVE
GENERAL
GENERALLY
GIVE
GIVEN
GIVES
GIVING
GOOD
GREATER
GREATLY
GUIDE
H
I
IBM
IF
II
III
IMPLICATIONS
IMPORTANCE
IMPORTANT
IMPROVED
IMPROVEMENT
IMPROVEMENTS
IMPROVING
IN
INC
INCLUDE
INCLUDED
INCLUDING
INCORPORATING
INCREASE
INCREASED
INCREASES
INCREASING
INFLUENCE
INFLUENCED
INFLUENCING
INNER
INSIDE
INSTEAD
INTERESTING
INTO
INVOLVING
IS

IT
ITS
ITSELF
IV
J
K
KEPT
L
LARGE
LARGER
LIKE
LIKELY
LONG
LOOK
LOW
LOWER
LTD
M
MADE
MAKE
MAKES
MAKING
MANY
MEANS
MET
METHOD
METHODS
MORE
MOST
MPH
MULTIPLE
MY
N
NEAR
NEARLY
NECESSARY
NEED
NEEDED
NEEDS
NEW
NEWER
NEWLY
NEXT
NINE
NO
NOT
NOW
O
OBSERVED
OBTAINABLE
OBTAINED
OBTAINING
OCCURRING
OF
OFF
ON
ONE
ONLY
ONTO
OR
OTHER
OUR
OUT
OVER
P
PARTICULAR
PER
POOR
POSSIBILITY
POSSIBLE
PRACTICAL
PRELIMINARY
PRESENCE
PRESENT
PRIMARY
PRINCIPLE
PRINCIPLES
PROCEDURE
PROCEDURES
PROGRAM
PROGRAMMING

PROGRAMS
PUT
Q
R
RECENT
REGARDING
RELATED
RELATING
RELATION
RELATIONSHIP
RELATIONSHIPS
RELATIVE
REQUIRE
REQUIRED
REQUIRES
REQUIRING
RESULTING
RESULTS
ROUTINE
S
SCHEME
SCHEMES
SEC
SECONDARY
SEE
SEEMS
SEEN
SELF
SEVEN
SEVENTH
SEVERAL
SHORT
SHORTER
SIGNIFICANCE
SIGNIFICANT
SIMILAR
SIMPLE
SIMPLER
SIMPLY
SINCE
SINGLE
SIX
SIXTH
SLOW
SLOWLY
SMALL
SMALLER
SMALLEST
SO
SOME
SPECIAL
SUBROUTINE
SUCH
SUGGESTED
SUGGESTIONS
SUITABLE
SUMMARY
SURVEY
SYSTEM
SYSTEMS
T
TAKE
TAKEN
TAKING
TECHNIQUE
TECHNIQUES
TEN
THAN
THAT
THE
THEIR
THEM
THEORETICAL
THERE
THEREFORE
THEREON
THESE
THEY
THIRD
THIS
THOSE

THOUGHTS
THREE
THROUGH
THRU
TO
TOGETHER
TOTAL
TOTALLY
TOWARD
TOWARDS
TRI
TWO
U
UNDER
UNTIL
UP
UPON
USAGE
USE
USED
USEFUL
USEFULNESS
USER
USERS
USES
USING
UTILIZATION
UTILIZE
UTILIZING
V
VARIOUS
VARYING
VERSUS
VERY
VI
VIA
VII
VIII
VS
W
WAS
WHAT
WHEN
WHERE
WHEREBY
WHICH
WHILE
WHO
WHOSE
WHY
WILL
WITH
WITHIN
WITHOUT
WOULD
X
XI
XII
XIII
Y
YET
YOUR
Z
2K
4K
8K
ICK
12K
14K
16K
0
1
2
3
4
5
6
7
8
9

Keyword-in-Context (KWIC) Index

IBM Programs

1130

1130-CM-02X — IBM 1130 SCIENTIFIC SUBROUTINE PACKAGE
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER L130-CM-02X

SSP/1130 IS A COLLECTION OF 121 FORTRAN SUBROUTINES WHICH PROVIDE A MAJOR ADDITION TO THOSE BUILT INTO FORTRAN. THEY ARE INPUT/OUTPUT-FREE, COMPUTATIONAL BUILDING BLOCKS THAT CAN BE COMBINED WITH A USERS INPUT, OUTPUT, OR COMPUTATIONAL ROUTINES TO MEET HIS INDIVIDUAL NEEDS. THE PACKAGE HAS WIDESPREAD APPLICATION TO THE SOLUTION OF PROBLEMS IN RESEARCH, DEVELOPMENT, AND DESIGN, IN BOTH SCIENCE AND ENGINEERING, WHEREVER FORTRAN IS USED. INDIVIDUAL SUBROUTINES, OR A COMBINATION OF THEM, CAN BE USED TO CARRY OUT THE FOLLOWING FUNCTIONS—
 - IN STATISTICS -- ANALYSIS OF VARIANCE /FACTORIAL DESIGN/... CORRELATION ANALYSIS... MULTIPLE LINEAR REGRESSION... POLYNOMIAL REGRESSION... CANONICAL CORRELATION... FACTOR ANALYSIS /PRINCIPAL COMPONENTS, VARIMAX/... DISCRIMINANT ANALYSIS /MANY GROUPS/... TIME SERIES ANALYSIS... DATA SCREENING AND ANALYSIS... NON-PARAMETRIC TESTS.
 - IN MATRIX MANIPULATION -- INVERSION... EIGENVALUES AND EIGENVECTORS /REAL SYMMETRIC CASE/... SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS... TRANSPOSITION... MATRIX ARITHMETIC /ADDITION, PRODUCT, ETC./... PARTITIONING... TABULATION AND SORTING OF ROWS OR COLUMNS... ELEMENTARY OPERATIONS ON ROWS OR COLUMNS.
 - IN OTHER MATHEMATICAL AREAS -- INTEGRATION OF GIVEN OR TABULATED FUNCTIONS... INTEGRATION OF UP TO SIX FIRST ORDER DIFFERENTIAL EQUATIONS... FOURIER ANALYSIS OF GIVEN OR TABULATED FUNCTIONS... BESSEL AND MODIFIED BESSEL FUNCTION EVALUATION... GAMMA FUNCTION EVALUATION... LEGENDRE FUNCTION EVALUATION... ELLIPTIC, EXPONENTIAL, SINE, COSINE, FRESNEL INTEGRALS... FINDING REAL ROOTS OF A GIVEN FUNCTION... FINDING REAL AND COMPLEX ROOTS OF REAL POLYNOMIAL EQUATIONS... POLYNOMIAL ARITHMETIC /ADDITION, DIVISION, ETC./... POLYNOMIAL EVALUATION, INTEGRATION, DIFFERENTIATION.

FEATURES—
 - ALL SUBROUTINES ARE FREE OF INPUT/OUTPUT STATEMENTS.
 - SUBROUTINES DO NOT CONTAIN PERMANENT MAXIMUM DIMENSIONS FOR THE DATA ARRAYS NAMED IN THEIR CALLING SEQUENCES.
 - ALL SUBROUTINES ARE WRITTEN IN FORTRAN.
 - MANY MATRIX MANIPULATION SUBROUTINES HANDLE SYMMETRIC AND DIAGONAL MATRICES /STORED IN ECONOMICAL, COMPRESSED FORMATS/ AS WELL AS GENERAL MATRICES.
 - THE USE OF IMPORTANT SUBROUTINES /OR GROUPS OF THEM/ IS ILLUSTRATED IN THE PROGRAM DOCUMENTATION BY SAMPLE MAIN PROGRAMS WITH INPUT/OUTPUT.
 - ALL SUBROUTINES ARE DOCUMENTED UNIFORMLY.
AS A LIBRARY OF SUBROUTINES, SSP/1130 ALLOWS THE USER TO SELECT THOSE FUNCTIONS WHICH HE NEEDS, WHILE NOT BEING BURDENED WITH UNNEEDED ROUTINES. THE SUBROUTINES WILL COMPILE AND EXECUTE WITH THE IBM 1130 DISK MONITOR FORTRAN COMPILER /1130-CS-001/.

MACHINE CONFIGURATION— THE MACHINE CONFIGURATION NECESSARY TO RUN SSP/1130 IS DEPENDENT UPON THE USE THAT IS TO BE MADE OF THE PACKAGE. EACH OF THE SUBROUTINES IS I/O FREE, COMPILES TO LESS THAN 1,200 WORDS OF CORE, AND IS, THEREFORE, CONFIGURATION INDEPENDENT. HOWEVER, MANY OF THE ROUTINES ARE INTENDED TO BE USED IN CONJUNCTION WITH OTHER SUBROUTINES OR TO SOLVE PROBLEMS USING LARGE ARRAYS OF DATA. FOR THIS REASON, MANY OF THE SUBROUTINES ARE NOT USEFUL WITH LESS THAN 8K WORDS OF CORE.
THE FOLLOWING ITEMS SHOULD BE TAKEN INTO CONSIDERATION WHEN DECIDING UPON THE APPLICABILITY OF THE PACKAGE TO A PARTICULAR MACHINE CONFIGURATION—
1. THE SIZE OF PROBLEM WHICH MAY BE EXECUTED ON A GIVEN 1130 DEPENDS UPON THE NUMBER OF SUBROUTINES USED, THE SIZE OF THE COMPILED SUBROUTINES, THE SIZE OF THE COMPILED MAIN PROGRAM, THE SIZE OF THE CONTROL PROGRAM AND THE DATA STORAGE REQUIREMENTS.
2. SSP/1130 WILL BE DISTRIBUTED IN CARD FORM ONLY.
3. THE SAMPLE PROGRAMS FOR SSP/1130 ILLUSTRATE THE SAME FUNCTIONS AS THE SSP/360 SAMPLE PROGRAMS. THREE OF THE SAMPLE PROGRAMS, CANONICAL CORRELATION, DISCRIMINANT ANALYSIS AND FACTOR ANALYSIS, USE THE OVERLAY FACILITIES OF THE 1130 DISK MONITOR PROGRAMMING SYSTEM /*LOCAL/ AND THEREFORE REQUIRE A DISK SYSTEM AND 8K WORDS OF CORE. THE REMAINING SAMPLE PROGRAMS DO NOT REQUIRE DISK BUT DO REQUIRE 8K WORDS OF CORE.

BASIC PROGRAM MATERIAL –
  DOCUMENTATION - APPLICATION DIRECTORY... APPLICATION DESCRIPTION, H20-C225... PROGRAMMERS MANUAL, H20-0252.
  MACHINE READABLE - SOURCE AND SAMPLE PROGRAM CARDS.

OPTIONAL PROGRAM MATERIAL –
  SYSTEMS MANUAL CONTAINING FLOWCHARTS FOR ALL SUBROUTINES.
OPTIONAL MATERIAL MUST BE ITEMIZED ON THE ORDER CARD.

1130-FO-001 — FORTRAN COMPILER
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-FO-001

THIS IS A CODING SYSTEM WITH A LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS. IT IS A SYSTEM PRIMARILY FOR SCIENTIFIC AND ENGINEERING COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND ENGINEERS WITH A METHOD OF COMMUNICATIONS THAT IS MORE FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL MACHINE LANGUAGE.

THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM STATEMENTS AS INPUT FROM CARDS OR PAPER TAPE AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM. AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES, SUCH AS RELOCATABLE SUBROUTINE, HIGHLY COMPRESSED FORMATS, AND FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE DATA CONVERSION OPERATIONS. THE FORTRAN COMPILER PROVIDES A HIGH LEVEL OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE REQUIREMENTS. THE UNITS SUPPORTED AT EXECUTION TIME ARE THE 1442 CARD READ PUNCH MDL 6 OR 7, PRINTER-KEYBOARD, 1132 PRINTER, 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. A SOURCE PROGRAM WRITTEN IN THE 1130 FORTRAN LANGUAGE IS PROCESSED BY THE FORTRAN COMPILER TO PRODUCE AN 1130 MACHINE LANGUAGE PROGRAM. THE 1130 SYSTEM LOADER, INPUT/OUTPUT ROUTINES FOR I/O FUNCTION, AND THE SYSTEM SUBPROGRAMS WILL BE LOADED WITH THE COMPILED PROGRAM PRIOR TO EXECUTION.
THE COMPILATION SPEED FOR THE SYSTEM INCLUDES THE TIME REQUIRED TO- READ IN SOURCE PROGRAM... READ IN COMPILER PHASES... COMPILE AND PUNCH CARD OBJECT DECK, ASSUMING- /1/ 400 CARD/MINUTE

CONTINUED FROM PRIOR COLUMN—
READ AND 160 CDL/PUNCH ON 1442 MDL 7, /2/ A 150 STATEMENT SOURCE PROGRAM, /3/ A 50 CARD OBJECT DECK PUNCHED, /4/ NO LISTINGS REQUIRED., THE COMPILATION WILL TAKE APPROXIMATELY 2.75 MINUTES. THIS TIME DOES NOT INCLUDE THE TIME TO PROCESS THE IBM 1130 SUBROUTINE LIBRARY. OBJECT EXECUTION SPEED IS DEPENDENT UPON PROGRAM TYPE, SIZE, I/O FUNCTIONS PERFORMED AND OTHER FACTORS PERTINENT TO PROGRAM EXECUTION SPEED. AVAILABLE CORE VARIES WITH THE NUMBER OF SYSTEM SUBPROGRAMS AND I/O ROUTINES USED. IN GENERAL, /1/ CORE STORAGE WORDS 0000-0635 WILL BE USED BY THE 1130 SYSTEM LOADER, 580 OF WHICH MAY BE USED FOR STORING MAINLINE VARIABLES AT EXECUTION TIME AND /2/ CORE STORAGE WORDS 0636-END OF MEMORY WILL BE USED FOR THE MAINLINE PROGRAM AND ANY SUBPROGRAMS CALLED BY IT. IF THE OBJECT PROGRAM IS COMPRESSED, HOWEVER, THE SYSTEM LOADER WILL OCCUPY THE FIRST 220 WORDS OF CORE STORAGE, OF WHICH 160 MAY BE USED FOR DATA STORAGE.

MINIMUM SYSTEM REQUIREMENTS- FOR COMPILATION -- A 4K WORD 1131 MDL 1... 1442 CARD READ PUNCH MDL 6 OR 7.

BASIC PROGRAM MATERIAL –
  DOCUMENTATION - PROGRAM MATERIAL LIST...SAMPLE FORTRAN PROGRAM DOCUMENTATION...ATTACHMENT TO USERS...OPERATORS GUIDE, C26-3629.
  MACHINE READABLE - OBJECT DECK AND SAMPLE PROGRAM.

1130-FO-002 — FORTRAN COMPILER
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-FO-002

THIS IS A CODING SYSTEM WITH A LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS. IT IS A SYSTEM PRIMARILY FOR SCIENTIFIC AND ENGINEERING COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND ENGINEERS WITH A METHOD OF COMMUNICATIONS THAT IS MORE FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL MACHINE LANGUAGE.

THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM STATEMENTS AS INPUT FROM CARDS OR PAPER TAPE AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM. AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES, SUCH AS RELOCATABLE SUBROUTINE, HIGHLY COMPRESSED FORMATS, AND FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE DATA CONVERSION OPERATIONS. THE FORTRAN COMPILER PROVIDES A HIGH LEVEL OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE REQUIREMENTS. THE UNITS SUPPORTED AT EXECUTION TIME ARE THE 1442 CARD READ PUNCH MDL 6 OR 7, PRINTER-KEYBOARD, 1132 PRINTER, 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. A SOURCE PROGRAM WRITTEN IN THE 1130 FORTRAN LANGUAGE IS PROCESSED BY THE FORTRAN COMPILER TO PRODUCE AN 1130 MACHINE LANGUAGE PROGRAM. THE 1130 SYSTEM LOADER, INPUT/OUTPUT ROUTINES FOR I/O FUNCTION, AND THE SYSTEM SUBPROGRAMS WILL BE LOADED WITH THE COMPILED PROGRAM PRIOR TO EXECUTION.
THE COMPILATION SPEED FOR THE TAPE SYSTEM INCLUDES THE TIME REQUIRED TO READ AND COMPILE A SOURCE PROGRAM AT THE RATE OF 33 STATEMENTS PER MINUTE PLUS 15 MINUTES TO READ THE COMPILER PHASES. HENCE, A 150 STATEMENT SOURCE PROGRAM TAKES APPROXIMATELY 23 MINUTES TO COMPILE ASSUMING- /1/ 30 CDL/SOURCE STATEMENT, /2/ 2000 WORDS OF OBJECT PROGRAM, /3/ 60 CPS READ ON THE 1134, AND /4/ 14.8 CPS PUNCH ON THE 1055. THIS TIME DOES NOT INCLUDE THE TIME TO PROCESS THE IBM 1130 SUBROUTINE LIBRARY.

MINIMUM SYSTEM REQUIREMENTS- FOR COMPILATION- A 4K WORD 1311 MDL 1... 1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL –
  DOCUMENTATION - PROGRAM MATERIAL LIST...SAMPLE FORTRAN PROGRAM DOCUMENTATION...OPERATORS GUIDE.
  MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING- SAMPLE PROGRAM...COMPILER-TYPEWRITER PHASE 1... COMPILER-TYPEWRITER PHASES 2-26...COMPILER-PRINTER PHASE 1...COMPILER-PRINTER PHASES 2-26.

1130-LM-001 — SUBROUTINE LIBRARY
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-LM-001

THE IBM 1130 SUBROUTINE LIBRARY HAS ARITHMETIC, FUNCTIONAL, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP SUBROUTINES FOR USE BY OBJECT PROGRAMS GENERATED BY THE 1130 ASSEMBLER OR THE 1130 FORTRAN COMPILER. THE FLOATING-POINT SUBROUTINES IN THE 1130 SUBROUTINE LIBRARY OFFER TWO RANGES OF PRECISION- STANDARD RANGE AND EXTENDED RANGE. THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION., THE EXTENDED RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES PROVIDED INCLUDE FLOATING POINT, FIXED POINT, SPECIAL FUNCTION, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES ARE USED BY FORTRAN COMPILER OR ASSEMBLER OBJECT PROGRAMS TO PERFORM FLOATING POINT, FIXED POINT ARITHMETIC, AND FUNCTIONAL OPERATIONS., THE CONVERSION OF DATA FROM ONE I/O CODE TO ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS FOR DEBUGGING PURPOSES.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MDL 1... APPLICABLE I/O EQUIPMENT FOR EXECUTION OF THE SUBROUTINES. MACHINE FEATURES AND UNITS SUPPORTED- A 4K OR 8K WORD 1131... 1442 CARD READ PUNCH MDL 6 OR 7... CONSOLE PRINTER-KEYBOARD... 2315 DISK CARTRIDGE... 1132 PRINTER... 1627 PLOTTER.

BASIC PROGRAM MATERIAL –
  DOCUMENTATION - PROGRAM MATERIAL LIST...ATTACHMENT TO USER... SUBROUTINE LIBRARY MANUAL, C26-5929.
  MACHINE READABLE - OBJECT DECK

1130-LM-002 — SUBROUTINE LIBRARY
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-LM-002

THE IBM 1130 SUBROUTINE LIBRARY HAS ARITHMETIC, FUNCTIONAL, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP SUBROUTINES FOR USE BY OBJECT PROGRAMS GENERATED BY THE 1130 ASSEMBLER OR THE 1130 FORTRAN COMPILER. THE FLOATING-POINT SUBROUTINES IN THE 1130 SUBROUTINE LIBRARY OFFER TWO RANGES OF PRECISION- STANDARD RANGE AND EXTENDED RANGE. THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION, THE EXTENDED RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES PROVIDED INCLUDE FLOATING POINT, FIXED POINT, SPECIAL FUNCTION, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES ARE USED BY FORTRAN COMPILER OR ASSEMBLER OBJECT PROGRAMS TO

IBM Programs

CONTINUED FROM PRIOR PAGE --
PERFORM FLOATING POINT, FIXED POINT ARITHMETIC, AND FUNCTIONAL
OPERATIONS., THE CONVERSION OF DATA FROM ONE I/O CODE TO
ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED
TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS FOR
DEBUGGING PURPOSES.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MDL 1... APPLICABLE
I/O EQUIPMENT FOR EXECUTION OF THE SUBROUTINES.

MACHINE FEATURES AND UNITS SUPPORTED- A 4K OR 8K WORD 1131...
1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH... CONSOLE
PRINTER-KEYBOARD... 2315 DISK CARTRIDGE... 1132 PRINTER...
1627 PLOTTER.

BASIC PROGRAM MATERIAL -
    DOCUMENTATION - PROGRAM MATERIAL LIST...SUBROUTINE LIBRARY
        MANUAL, C26-5929.
    MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING-
        IAS, ILS AND CONVERSION SUBROUTINES...ARITHMETIC,
        FUNCTIONAL, AND FORTRAN I/O SUBROUTINES-STANDARD
        PACKAGE...ARITHMETIC, FUNCTIONAL, AND FORTRAN I/O
        SUBROUTINES - EXTENDED PACKAGE.

1130-CS-001   DISK MONITOR PROGRAMMING
SYSTEM
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1130-CS-001

    THE MONITOR SYSTEM IS A DISK-ORIENTED SYSTEM ALLOWING THE
    USER TO ASSEMBLE, COMPILE, AND/OR EXECUTE INDIVIDUAL OR
    SEVERAL PROGRAMS WITH A MINIMUM OF OPERATOR INTERVENTION.
    JOBS TO BE PERFORMED ARE STACKED AND SEPARATED BY CONTROL
    RECORDS THAT IDENTIFY THE JOBS. THE MONITOR SYSTEM ALSO
    PROVIDES THE FLEXIBILITY TO PROGRAM FOR THE DIVERSE APPLICATIONS
    OF GENERAL ENGINEERING.
    THE 1130 MONITOR SYSTEM IS COMPRISED OF FIVE SEPARATE PROGRAMS-
    - SUPERVISOR.
    - SUBROUTINE LIBRARY.
    - DISK UTILITY.
    - ASSEMBLER.
    - FORTRAN COMPILER.

    JOB RECORDS IDENTIFY JOBS TO BE PERFORMED BY THE
    1130 MONITOR SYSTEM.
    - SUPERVISOR CONTROL RECORDS SPECIFY THE FUNCTIONS TO BE
      PERFORMED., E.G., ASSEMBLY, FORTRAN COMPILATION, EXECUTE AN
      ASSEMBLED OR COMPILED PROGRAM, CALL THE DISK UTILITY
      PROGRAM. CONTROL RECORDS RECOGNIZED BY THE FUNCTION TO BE
      PERFORMED GIVE FURTHER INSTRUCTIONS REGARDING THE JOB, SUCH
      AS LIST DECK, LIST, PRINT SYMBOL TABLE, DUMP, STORE,
      DUMP LET, ETC.
    - THE SUBROUTINE LIBRARY I/O PROGRAMS CAN BE CALLED BY THE
      USER TO ACCOMPLISH THE INPUTING AND OUTPUTING OF DATA
      FROM AND TO THE ATTACHED PERIPHERAL DEVICES.
    - THE DISK UTILITY PROGRAM PROVIDES THE USER WITH A USEFUL
      TOOL FOR EASILY STORING DATA AND PROGRAMS ON THE DISK
      UNIT AND QUICKLY RETRIEVING AND USING THE INFORMATION.
    - THE ASSEMBLER PERMITS THE PROGRAMMER TO CODE A PROBLEM
      IN A LANGUAGE THAT IS MORE MEANINGFUL AND EASIER TO
      HANDLE THAN THE ACTUAL MACHINE LANGUAGE.
    - THE FORTRAN COMPILER PERMITS THE USER TO UTILIZE THE
      1130 SYSTEM FOR SOLVING PROBLEMS WITH ONLY A SLIGHT
      KNOWLEDGE OF THE SYSTEM AND A SHORT PERIOD OF INSTRUCTION.
    THE FORTRAN COMPILER SPEEDS FOR A 150 CARD SOURCE PROGRAM
    ARE APPROXIMATELY 3.8 MINUTES WITH LISTING, 1.8 MINUTES
    WITHOUT LISTING AND 7.2 MINUTES WITH A CONSOLE PRINTER
    LISTING ASSUMING A 1442 MODEL 6 OR 7 CARD READER PUNCH.
    FORTRAN OBJECT PROGRAM EXECUTION SPEED IS DEPENDENT UPON
    PROGRAM TYPE, SIZE, I/O FUNCTIONS PERFORMED, AND OTHER
    FACTORS PERTINENT TO PROGRAM EXECUTION SPEED.
    THE ASSEMBLER PROGRAM SPEEDS FOR CARD INPUT WITH 1442 MODEL 7
    INPUT ARE- 320 CARDS/MIN. WITH NO LISTING, 64 CARDS/MIN.
    WITH 1132 LISTING, AND 17 CARDS/MIN. WITH CONSOLE PRINTER
    LISTING. CORRESPONDING SPEEDS FOR 1442 MDL 6 INPUT ARE
    250, 60 AND 17 CARDS PER MIN. RESPECTIVELY.

    MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MODEL 2...
    1442 CARD READ PUNCH MDL 6 OR 7.

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... ATTACHMENT TO
            USERS... MONITOR REFERENCE MANUAL, C26-3750.
        MACHINE READABLE - OBJECT DECKS AND SAMPLE PROBLEMS.

1130-CS-002   DISK MONITOR PROGRAMMING
SYSTEM
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1130-CS-002

    THE MONITOR SYSTEM IS A DISK-ORIENTED SYSTEM ALLOWING THE
    USER TO ASSEMBLE, COMPILE, AND/OR EXECUTE INDIVIDUAL OR
    SEVERAL PROGRAMS WITH A MINIMUM OF OPERATOR INTERVENTION.
    JOBS TO BE PERFORMED ARE STACKED AND SEPARATED BY CONTROL
    RECORDS THAT IDENTIFY THE JOBS. THE MONITOR SYSTEM ALSO
    PROVIDES THE FLEXIBILITY TO PROGRAM FOR THE DIVERSE APPLICATIONS
    OF GENERAL ENGINEERING.
    THE 1130 MONITOR SYSTEM IS COMPRISED OF FIVE SEPARATE PROGRAMS-
    - SUPERVISOR.
    - SUBROUTINE LIBRARY.
    - DISK UTILITY.
    - ASSEMBLER.
    - FORTRAN COMPILER.

    JOB RECORDS IDENTIFY JOBS TO BE PERFORMED BY THE 1130
    MONITOR SYSTEM.
    - SUPERVISOR CONTROL RECORDS SPECIFY THE FUNCTIONS TO BE
      PERFORMED., E.G., ASSEMBLY, FORTRAN COMPILATION, EXECUTE AN
      ASSEMBLED OR COMPILED PROGRAM, CALL THE DISK UTILITY PROGRAM.
      CONTROL RECORDS RECOGNIZED BY THE FUNCTION TO BE PERFORMED
      GIVE FURTHER INSTRUCTIONS REGARDING THE JOB, SUCH AS LIST
      DECK, LIST, PRINT SYMBOL TABLE, DUMP, STORE, DUMP LET, ETC.
    - THE SUBROUTINE LIBRARY I/O PROGRAMS CAN BE CALLED BY THE
      USER TO ACCOMPLISH THE INPUTING AND OUTPUTING OF DATA
      FROM AND TO THE ATTACHED PERIPHERAL DEVICES.
    - THE DISK UTILITY PROGRAM PROVIDES THE USER WITH A USEFUL
      TOOL FOR EASILY STORING DATA AND PROGRAMS ON THE DISK
      UNIT AND QUICKLY RETRIEVING AND USING THE INFORMATION.
    - THE ASSEMBLER PERMITS THE PROGRAMMER TO CODE A PROBLEM
      IN A LANGUAGE THAT IS MORE MEANINGFUL AND EASIER TO
      HANDLE THAN THE ACTUAL MACHINE LANGUAGE.
    - THE FORTRAN COMPILER PERMITS THE USER TO UTILIZE THE
      1130 SYSTEM FOR SOLVING PROBLEMS WITH ONLY A SLIGHT

CONTINUED FROM PRIOR COLUMN--
    KNOWLEDGE OF THE SYSTEM AND A SHORT PERIOD OF INSTRUCTION.
    THE FORTRAN COMPILER SPEEDS FOR A 150 SOURCE STATEMENT
    PROGRAM ARE APPROXIMATELY 3.8 MINUTES WITH LISTING, 2.5
    MINUTES WITHOUT LISTING AND 7.2 MINUTES WITH A CONSOLE
    PRINTER LISTING ASSUMING AN 1134 READER AND 1055 PUNCH.
    FORTRAN OBJECT PROGRAM EXECUTION SPEED IS DEPENDENT UPON
    PROGRAM TYPE, SIZE, I/O FUNCTIONS PERFORMED, AND OTHER
    FACTORS PERTINENT TO PROGRAM EXECUTION SPEED.
    THE ASSEMBLER PROGRAM SPEEDS FOR PAPER TAPE INPUT WITH
    1134 READER INPUT ARE- 120 STATEMENTS/MIN. WITH NO LISTING,
    44 STATEMENTS/MIN. WITH 1050 LISTING, AND 16 STATEMENTS/MIN.
    WITH CONSOLE PRINTER LISTING.

    MINIMUM SYSTEM REQUIREMENTS- A 4K WORD 1131 MODEL 2...
    1134 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH.

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... MONITOR REFERENCE
            MANUAL, C26-375C.
        MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING-
            SYSTEM LOADER - PART 1... LOAD MODE CONTROL RECORD...
            SYSTEM LOADER - PART 2... SYSTEM CONFIGURATION...
            SUPERVISOR AND LOADER... DISK UTILITY PROGRAMS...
            FORTRAN COMPILER... ASSEMBLER... SUBROUTINE LIBRARY...
            COLD START TAPE RECORD... DPIR... 1132 CORE DUMP...
            CONSOLE PRINTER DUMP... SAMPLE FORTRAN PROGRAM...
            SAMPLE ASSEMBLY PROGRAM.

1130-SE-25X   IBM 1130 COMMERCIAL
SUBROUTINE PACKAGE
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1130-SE-25X

    THE 1130 COMMERCIAL SUBROUTINE PACKAGE PROVIDES THE SCIENTIFIC
    USER WITH ADDED CAPABILITIES FOR HANDLING FUNCTIONS AND
    TECHNIQUES COMMON TO COMMERCIAL PROGRAMMING. THIS SET OF
    EIGHT SUBROUTINES ARE CALLABLE BY THE FORTRAN PROGRAMMER
    IN A SIMILAR MANNER TO SUCH STANDARD FUNCTIONS AS SINE, COSINE,
    SQUARE ROOT, ETC. THESE FORTRAN WRITTEN SUBROUTINES /ONE IS
    IN ASSEMBLER LANGUAGE/ ARE INDEPENDENT OF INPUT AND OUTPUT.
    THEY WILL PROVIDE THE SCIENTIFIC 1130 USER WITH FLEXIBILITY
    TO ADD LIMITED COMMERCIAL APPLICATIONS SUCH AS PAYROLL,
    COST ACCOUNTING, AND MANY OTHERS. FEATURES ARE-
    - VARIABLE LENGTH ALPHAMERIC MOVE.
    - VARIABLE LENGTH ALPHAMERIC COMPARE.
    - VARIABLE LENGTH CONVERSION FROM EBCDIC TO FLOATING-POINT.
    - VARIABLE LENGTH CONVERSION FROM FLOATING-POINT TO EBCDIC.
    - ZONE MANIPULATION.
    - FILL AN AREA WITH A SPECIFIED CHARACTER.
    - STACKER SELECT.
    STACKER SELECT IS PROGRAMMED IN 1130 ASSEMBLER LANGUAGE,
    ALL OTHER ROUTINES ARE PROGRAMMED IN 1130 FORTRAN. THE
    INTERNAL FORMAT OF DATA IS ONE CHARACTER PER WORD.

    MINIMUM SYSTEM REQUIREMENTS- FOR EXECUTION - AN 1131 MODEL 1B
    OR 2B... 1442 CARD READ PUNCH MODEL 6 OR 7. IN ADDITION,
    THE CONSOLE PRINTER, 1134 PAPER TAPE READER,
    1055 PAPER TAPE PUNCH AND 1132 PRINTER ARE SUPPORTED.
    FOR COMPILATION AND ASSEMBLY ONLY, THE MINIMUM 1130 FORTRAN
    CARD SYSTEM REQUIREMENTS ARE SUFFICIENT.

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - APPLICATION DIRECTORY... APPLICATION
            DESCRIPTION, H20-0221... REFERENCE MANUAL /INCLUDING
            OPERATING INSTRUCTIONS, LISTINGS, FLOW CHARTS AND
            NARRATIVE/, H20-0241.
        MACHINE READABLE - SOURCE AND SAMPLE PROBLEM DECKS.

1130-SP-001   ASSEMBLER PROGRAM
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1130-SP-001

    THE IBM 1130 ASSEMBLER PROVIDES THE PROGRAMMER A FLEXIBLE AND
    MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO CODE THAN A
    BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE ASSEMBLED BY THE
    PROCESSOR IN TWO PASSES. THE ASSEMBLER AUTOMATICALLY ASSIGNS
    AND KEEPS A RECORD OF STORAGE LOCATIONS AND CHECKS FOR CODING
    ERRORS. BY RELIEVING THE PROGRAMMER OF THESE BURDENSOME TASKS,
    THE ASSEMBLER SIGNIFICANTLY REDUCES THE AMOUNT OF PROGRAMMING
    TIME AND EFFORT REQUIRED TO PREPARE A PROGRAM. A COMPRESSOR
    PROGRAM COMPRESSES SYMBOLICALLY ASSEMBLED OUTPUT INTO A FORM
    SUITABLE FOR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR
    ALWAYS USE ALL OF CORE STORAGE AVAILABLE ON AN ASSEMBLY MACHINE.
    THE PROGRAMS DETERMINE MEMORY SIZE AUTOMATICALLY AT ASSEMBLY
    TIME AND ADJUST TABLE PARAMETERS ACCORDINGLY. APPROXIMATELY
    520 LABELS MAY BE HELD IN A 4K MEMORY. THE ASSEMBLER PROVIDES
    FOR ASSEMBLY OF BOTH ABSOLUTE AND RELOCATABLE MAINLINE
    PROGRAMS, AND FOR ASSEMBLY OF RELOCATABLE SUBROUTINES. BY MEANS
    OF ENT AND CALL STATEMENTS, PROVISION IS MADE FOR AUTOMATIC
    SYMBOLIC CROSS-REFERENCING BETWEEN PROGRAMS AT LOAD TIME. THE
    ASSEMBLER CAN BE USED TO GENERATE SUBROUTINES AND SUBPROGRAMS
    FOR FORTRAN MAIN PROGRAMS. SIMILARLY, ASSEMBLER MAIN PROGRAMS
    CAN CALL FORTRAN SUBROUTINES OR SUBPROGRAMS, AS WELL AS
    SUBROUTINE LIBRARY AND UTILITY ROUTINES. THE ASSEMBLER ALSO
    PROVIDES FACILITIES FOR ASSEMBLING INTERRUPT PROCESSING
    SUBROUTINES WHICH MAY BE INCORPORATED INTO THE SYSTEM.
    AT OBJECT TIME, THE RELOCATING LOADER NORMALLY OCCUPIES CORE
    STORAGE LOCATIONS 0000 THROUGH 0635. INSTRUCTIONS AND DATA
    MAY NOT BE LOADED INTO THIS AREA, HOWEVER, MOST OF THIS AREA MAY
    BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STORAGE. A CORE
    IMAGE CONVERTER IS PROVIDED WHICH WILL CONVERT THE RELOCATABLE
    BINARY OBJECT DECKS OF A MAINLINE AND ALL CALLED SUBROUTINES,
    INTO A SINGLE CORE IMAGE BINARY DECK. THIS DECK MAY THEN BE
    LOADED WITH A CORE IMAGE LOADER WHICH HAS NO RELOCATING OR
    CROSS-REFERENCING ABILITIES. THIS LOADER WILL OCCUPY
    /APPROXIMATELY/ CORE LOCATIONS 0000 THROUGH 0220. MUCH OF THIS
    AREA MAY BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STORAGE.
    THE ASSEMBLY SPEEDS FOR THE ASSEMBLERS AND COMPRESSORS ARE
    LIMITED BY THE SPEED OF THE I/O DEVICES. ALTHOUGH FOR EXTREMELY
    LARGE PROGRAMS WITH MANY LABELS /E.G., A 700 LABEL PROGRAM
    BEING ASSEMBLED ON AN 8K MACHINE/, A SLIGHT REDUCTION MAY BE
    EXPECTED IN THE SPEED ON THE ORDER OF 10 PER CENT.

    THROUGHPUT SPEED FOR ASSEMBLY AND COMPRESSION /NOT COUNTING
    PROCESSOR LOAD TIME/ -
    - 1442 MODEL 6 -- 67-77 STATEMENTS/MINUTE
      /THE VARIATION MAY BE ASCRIBED TO VARYING NUMBERS OF
      COMMENTS STATEMENTS WHICH DO NOT REQUIRE PUNCHING./
    - 1442 MODEL 7 -- 90-100 STATEMENTS/MINUTE
    - PROCESSOR LOAD TIMES ARE AS FOLLOWS --
      WITH 1442 MDL 6, ASSEMBLER-12 SECONDS, COMPRESSOR-9 SECONDS
      WITH 1442 MDL 7, ASSEMBLER-9 SECONDS, COMPRESSOR-7 SECONDS

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MINIMUM SYSTEM REQUIREMENTS- FOR PROGRAM GENERATION AND
EXECUTION -- A 4K WORD 1131 MOL 1... 1442 CARD READ PUNEH
MOL 6 CR 7.

BASIC PROGRAM MATERIAL -
OOCUMENTATION - PROGRAM MATERIAL LIST...OPERATORS GUIDE
C26-3629...ATTACHMENT TO USERS...SANPLE ASSEMBLY
ODCUMENTATION.
MACHINE READABLE - OBJECT DECK ANO SANPLE PROGRAN.

1130-SP-002   ASSEMBLER PROGRAM
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 113D-SP-002

THE IBM 1130 ASSEMBLER PROVIOES THE PROGRAMMER A FLEXIBLE ANO
MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO CODE THAN A
BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE ASSEMBLEO BY THE
PRCCESSOR IN TWO PASSES. THE ASSEMBLER AUTOMATICALLY ASSIGNS
ANO KEEPS A RECORO OF STORAGE LOCATIONS AND CHECKS FOR CCOING
ERRORS. BY RELIEVING THE PROGRAMMER OF THESE BURDENSOME TASKS,
THE ASSEMBLER SIGNIFICANTLY REDUCES THE AMOUNT OF PROGRAMMING
TIME AND EFFORT REQUIRED TO PREPARE A PROGRAM. A COMPRESSOR
PROGRAM COMPRESSES SYMBOLICALLY ASSEMBLEO OUTPUT INTO A FORM
SUITABLE FCR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR
ALWAYS USE ALL OF CORE STORAGE AVAILABLE ON AN ASSEMBLY MACHINE.
THE PROGRAMS DETERNINE MEMORY SIZE AUTOMATICALLY AT ASSEMBLY
TIME AND ACJUST TABLE PARAMETERS ACCOROINGLY. APPROXIMATELY
52D LABELS MAY BE HELD IN A 4K MEMORY. THE ASSEMBLER PROVIDES
FOR ASSEMBLY OF BOTH ABSOLUTE AND RELOCATABLE MAINLINE
PROGRANS, ANO FOR ASSEMBLY OF RELOCATABLE SUBROUTINES. BY NEANS
OF ENT AND CALL STATEMENTS, PROVISION IS NAOE FOR AUTONATIC
SYMBCLIC CROSS-REFERENCING BETWEEN PROGRANS AT LOAD TIME. THE
ASSEMBLER CAN BE USEO TO GENERATE SUBROUTINES ANO SUBPROGRAMS
FOR FORTRAN MAIN PROGRAMS. SIMILARLY, ASSEMBLER MAIN PROGRAMS
CAN CALL FORTRAN SUBROUTINES OR SUBPROGRAMS, AS WELL AS
SUBRCUTINE LIBRARY ANO UTILITY ROUTINES. THE ASSEMBLER ALSO
PRCVIOES FACILITIES FOR ASSEMBLING INTERRUPT PROCESSING
SUBROUTINES WHICH MAY BE INCORPORATEO INTO THE SYSTEN.
AT OBJECT TIME, THE RELOCATING LOADER NORMALLY OCCUPIES CORE
STCRAGE LOCATIENS D000 THROUGH 0635. INSTRUCTIONS AND OATA
NAY NOT BE LOACEO INTO THIS AREA, HOWEVER, MOST OF THIS AREA MAY
BE USED AS INPUT/OUTPUT BUFFERS AND WORKING STDRAGE. A CORE
IMAGE CONVERTER IS PROVICEO WHICH WILL CONVERT THE RELCCATABLE
BINARY OBJECT DECKS OF A NAINLINE AND ALL CALLEO SUBROUTINES,
INTO A SINGLE CORE IMAGE BINARY DECK. THIS DECK MAY THEN BE
LOADEO WITH A CORE INAGE LOADER WHICH HAS NO RELDCATING CR
CRCSS-REFERENCING ABILITIES. THIS LOADER WILL OCCUPY
/APPRCXIMATELY/ CORE LCCATIONS D0D0 THROUGH 022D. MUCH OF THIS
AREA MAY BE USEO AS INPUT/OUTPUT BUFFERS ANO WORKING STCRAGE.
THE ASSEMBLY SPEEDS FOR THE ASSENBLERS AND COMPRESSORS ARE
LINITEO BY THE SPEED OF THE I/O DEVICES, ALTHOUGH FOR EXTREMELY
LARGE PROGRANS WITH NANY LABELS /E.G., A 70D LABEL PRCGRAN
BEING ASSEMBLEO ON AN 8K NACHINE/, A SLIGHT REOUCTION MAY BE
EXPECTED IN THE SPEEO CN THE OROER OF 1D PER CENT.

THROUGHPUT SPEEC- PAPER TAPE SYSTEN WITH I134 ANO ID55 -- 6-17
STATEMENTS/MINUTE
THE VARIATION MAY BE ASCRIBEO TO --
A. THE EXTENT OF REMARKS ON THE STATENENTS, WHICH AFFECT THE TAPE
LENGTH ANO HENCE THE READ/PUNCH TIME, AND
8. WHETHER OR NOT THE OPTIONAL TYPEWRITER LISTING IS REQUESTEO
DURING THE COMPRESSICN. THIS LISTING EFFECTIVELY REOUCES THE
REAO SPEED TO 15 CHARACTERS/SECONO, THE TYPEWRITER SPEEO.

MINIMUM SYSTEM REQUIRENENTS- FOR PROGRAM GENERATION ANO
EXECUTION- A 4K WORD 113I MOL 1... 1134 PAPER TAPE READER AAO
ID55 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL -
OOCUMENTATION - PRCGRAM MATERIAL LIST...OPERATORS GUIDE
C26-3629...SANPLE ASSEMBLY OOCUMENTATION.
MACHINE READABLE - ONE PAPER TAPE FOR EACH OF THE FOLLOWING-
SANPLE PROGRAM...ASSENBLER...COMPRESSOR.

1130-UT-001   UTILITY ROUTINES
ORDER THRCUGH LOCAL IBN BRANCH OFFICE
SPECIFY FILE NUMBER 1130-UT-D01

THE IBM 113D UTILITY ROUTINES ARE PART OF THE BASIC PRCGRAMMING
SYSTEN TO BE USED BY ALL 1130 INSTALLATIONS. THESE PRCGRANS NAKE
IT POSSIBLE TO PROGRAN THE 1130 IN A WIDE RANGE DF GENERAL
ENGINEERING APPLICATIONS. THE UTILITY ROUTINES INCLUOE-
/1/ AN INPUT/OUTPUT ROUTINE WHICH ACCEPTS OATA FRON ONE CF TWC
INPUT MEOIA /CARO OR PAPER TAPE/ ANO OUTPUTS OATA TO ONE CR TWC
OF FCUR OUTPUT OEVICES /CARO, PAPER TAPE, 1132 OR CONSOLE
PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIREO, ONE NUST BE A
PRINT GPTION /CONSOLE PRINTER OR 1132 PRINTER/. /2/ DLMP
ROUTINES WHICH PERNIT THE USER TO OUNP ANY AREA
OF MEMORY., OUTPUT CAN BE OBTAINEO ON CARDS,
CONSCLE PRINTER OR 1132 PRINTER. /3/ LOADER
ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER, ANO CORE
IMAGE LOADER. THESE ROUTINES PROVIDE THE PROGRANNER WITH A
VERSATILE TDDL FOR TRANSFERRING OATA FROM ONE MEDIUN TC
ANCTHER, AND ALSO FOR PERFORNING THE REPETITIVE UTILITY FUNCTICNS
NEEOEO OAILY FCR MOST CATA PROCESSING INSTALLATIONS. THEY ALSC
INCLUDE ROUTINES TO AIC THE USER IN OEBUGGING HIS PROGRAMS. IN
ADDITICN, THEY PROVIOE THE FACILITIES FOR- /1/ LOADING CONPRESSED
BINARY OBJECT PRCGRAM CAROS IN EITHER RELOCATABLE OR CCRE IMAGE
FORMAT, /2/ GENERATING OBJECT PROGRAM CORE NAPS.

NINIMUM SYSTEM REQUIRENENTS- A 4K WORD 1131 MOL 1...
1442 CARD READ PUNCH NCL 6 OR 7.

BASIC PROGRAM KATERIAL -
OOCUMENTATION - PRCGRAM MATERIAL LIST...ATTACHMENT TO USER...
OPERATCRS GUIOE, C26-3629.
MACHINE READABLE - OBJECT DECK.

1130-UT-002   UTILITY ROUTINES
ORDER THROUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUMBER 1130-UT-002

THE IBM 1130 UTILITY ROUTINES ARE PART OF THE BASIC PROGRAMMING
SYSTEN TO BE USED BY ALL 113D INSTALLATIONS. THESE PRCGRANS NAKE
IT POSSIBLE TO PROGRAN THE 1130 IN A WIDE RANGE DF GENERAL
ENGINEERING APPLICATIONS. THE UTILITY ROUTINES INCLUOE-
/1/ AN INPUT/OUTPUT ROUTINE WHICH ACCEPTS DATA FROM ONE OF TWC
INPUT MEOIA /CARO OR PAPER TAPE/ ANO OUTPUTS DATA TO ONE OR TWC
OF FOUR OUTPUT OEVICES /CARO, PAPER TAPE, 1132 OR CONSOLE
PRINTER/. WHEN TWO OUTPUT OEVICES ARE REQUIREO, ONE MUST BE A

CONTINUED FROM PRIOR CCLUMN--
PRINT CPTION /CONSOLE PRINTER OR 1132 PRINTER/. /2/ OUNP
ROUTINES WHICH PERMIT THE USER TO OUMP ANY AREA OF NEMORY.,
OUTPUT CAN BE OBTAINEO ON CARDS, CONSOLE PRINTER OR 1132 PRINTER.
/3/ LOAOER ROUTINES - RELOCATING LOADER, CORE IMAGE CCNVERTER,
ANC CORE IMAGE LOACER. THESE ROUTINES PROVIDE THE PRCGRAMNER
WITH A VERSATILE TOOL FCR TRANSFERRING DATA FRON ONE NEOIUM TC
ANCTHER, AND ALSO FOR PERFORMING THE REPETITIVE UTILITY
FUNCTIONS NEEOEO OAILY FOR NOST DATA PROCESSING INSTALLATICNS.
THEY ALSO INCLUDE ROUTINES TO AIO THE USER IN DEBUGGING HIS
PRCGRAMS. IN AODITION, THEY PROVIDE THE FACILITIES FOR-
/I/ LOADING COMPRESSED BINARY OBJECT PROGRAM CAROS IN EITHER
RELOCATABLE OR CORE IMAGE FORNAT, /2/ GENERATING OBJECT PROGRAM
CCRE NAPS.

MINIMUM SYSTEM REQUIREMENTS- A 4K WORO 1131 NOL 1...
1134 PAPER TAPE READER AND ID55 PAPER TAPE PUNCH.

BASIC PROGRAM MATERIAL -
COEUMENTATION - PROGRAM NATERIAL LIST...OPERATORS GUIOE,
C26-3629.
MACHINE READABLE - ONE PAPER TAPE FOR EAEH OF THE FCLLCWING-
RELOCATING LOACER...CORE INAGE LOADER...CORE INAGE
CONVERTER-CORE MAP ON TYPEWRITER...CORE IMAGE CONVERTER-
CORE MAP ON PRINTER...OUNP AND CONSOLE UTILITIES...
I/O UTILITIES...CONSTRUCT PAPER TAPE - A ROUTINE FOR
COMPRESSING SUBROUTINES...EOO 1...EOO 2...DPIR...USER
EXIT SPECIAL USER EOD...USER EXIT OVERLAY RECORD...
ONE RECORD TYPEWRITER DUMP...KEYBOARD ROUTINE.

1800

1800-AS-DD5   ASSEMBLER LANGUAGE
ORDER THRCUGH LOCAL IBM BRANCH OFFICE
SPECIFY FILE NUNBER 1800-AS-DC5

THE IBN 1800 ASSEMBLER LANGUAGE PRDVIOES THE PROGRANMER A
FLEXIBLE AND MEANINGFUL SYNBOLIC LANGUAGE THAT IS EASIER TO
CCDE THAN A BINARY MACHINE LANGUAGE. SOURCE PROGRAMS ARE
ASSEMBLEO BY THE PROCESSOR IN TWD PASSES. THE ASSEMBLER
AUTDMATICALLY ASSIGNS ANO KEEPS A RECORO DF STORAGE LOCATICNS
AND CHECKS FOR COOING ERRDRS. BY RELIEVING THE PROGRANMER
CF THESE BUROENSOME TASKS, THE ASSEMBLER REDUCES SIGNIFICANTLY
THE ANCUNT OF PRCGRANMING TIME AND EFFORT REQUIREO TO PREPARE
A PROGRAM. A EOMPRESSOR PROGRAM IS PRDVIDEO WITH THE ASSEMBLER
TO CCNPRESS SYMBOLICALLY ASSENBLEO OUTPUT INTO A FCRN SUITABLE
FOR EXECUTION. THE ASSEMBLER AND ITS COMPRESSOR ALWAYS USE
ALL CORE STORAGE AVAILABLE CN AN ASSEMBLY MACHINE. THE PRCGRAMS
CETERNINE MEMORY SIZE AUTOMATICALLY AI ASSENBLY TINE AND
ADJUST TABLE PARAMETERS ACCOROINGLY. THE ASSEMBLER PROVIUES
FCR ASSEMBLY OF BOTH ABSDLUTE ANO RELOCATABLE MAINLINE
PREGRAMS, AND FDR ASSEMBLY DF RELDEATABLE SUBROUTINES.
BY NEANS OF ENT ANC CALL STATENENTS, PROVISION IS MADE FCR
AUTOMATIC SYMBOLIC CROSS-REFERENCING BETWEEN PROGRAMS AT
LOAO TIME. THE ASSEMBLER MAY BE USED TO GENERATE SUBROUTINES
AND SUBPROGRAMS FOR FORTRAN MAIN PROGRAMS. SIMILARLY,
ASSEMBLER MAIN PROGRANS NAY CALL FORTRAN SUBROUTINES CR
SUBPROGRAMS, AS WELL AS SUBROUTINE LIBRARY ANO UTILITY
ROUTINES. A CORE INAGE EONVERTER IS PROVIDEO WHICH WILL
CCNVERT THE RELOCATABLE BINARY DBJECT TAPE OF A MAINLINE
ANC ALL CALLEO SUBROUTINES INTO A SINGLE CORE INAGE BINARY
TAPE. THIS TAPE MAY THEN BE LOADEO WITH A CORE INAGE
LOAOER WHICH HAS NO RELOCATING OR CROSS-REFERENCING ABILITILS.
THE ASSEMBLY AND COMPRESSICN RATE WILL VARY WITH THE NUMBER
OF CHARACTERS PER STATEMENT IN THE PROGRAM. IN GENERAL,
THE TOTAL PROCESSING TIME WILL BE PROPCRITCNAL TO THE TOTAL
NUMBER OF CHARACTERS IN THAT INPUT PROGRAN, PLUS THE ASSENBLLR
OR CCMPRESSOR LOAD TIME.
- THE ASSEMBLER LOAO TINE IS 5.5 MINUTES.
- THE COMPRESSOR LOAD TINE IS 3.7 MINUTES.
FCR COMPRESSING ALL BUT VERY SNALL PROGRAMS, THE CCNPRESSICN
RATE WILL BE AEOUT 16 STATEMENTS/MINUTE /FIGUREO ON STATEMENT
SIZE OF ABOUT 26 CHARACTERS/. FOR VEHY SMALL SUBROUTINES,
THE RATE WILL BE SOMEWHAT LOWER OUE TO THE EXTRA TINE REQUIRLD
TO PUNCH THE LCAOER OVERLAY RECORDS. THE 1054 READS 15
CHARACTERS/SECDND AND THE 1055 PUNCHES
15 CHARACTERS/SECONO.
MINIMUM SYSTEM REQUIRENENTS- FOR PROGRAM GENIRATICN ANC
EXECUTION -- A 4,096 WCRD 1BCD SYSTEM PROCESSER-CONTHCLLOR...
1442 CARD REAO PUNCH MODEL 6 OR 7 AND ENGINEERING CHANGE
LEVEL 415164.

BASIC PROGRAM NATERIAL -
OOCUMENTATION - PRCGRAM MATERIAL LIST... OPERATORS
GUIDE C26-3751.
NACHINE READACLE - ASSEMBLER OECK... COMPRESSOR DECK...
SAMPLE PROGRAN.

1800-AS-006   ASSEMBLER LANGUAGE
ORDER THRCUGH LOCAL IBM BRANCH CFFICE
SPECIFY FILE NUNBER 1800-AS-OC6

THE IBM 1800 ASSEMBLER LANGUAGE PROVIOES THE PROGRANNER A
FLEXIBLE AND MEANINGFUL SYMBOLIC LANGUAGE THAT IS EASIER TO
CODE THAN A BINARY MACHINE LANGUAGE. SOURCL PROGRAN? ARE
ASSEMBLED BY THE PROCESSOR IN TWO PASSES. THE ASSENNLER
AUTOMATICALLY ASSIGNS AND KEEPS A RECORO OF STORAGE LUCATICNS
ANC CHECKS FOR COOING ERRDRS. BY RELIEVING THE PROGRANNER
DF THESE BURDENSOME TASKS, THE ASSEMBLER REDUCES SIGNIFICANILY
THE AMOUNT OF PROGRAMMING TINE AND EFFORT RIQUIREO TO PREPARI
A PRCGRAM. A COMPRESSOR PROGRAN IS PRDVIOEO WITH THE ASSENBLLR
TO CCMPRESS SYMBOLICALLY ASSENBLEO OUTPUT INTO A FORM SUITANLE
FCR EXECUTION. THE ASSENBLER ANO ITS CONPRESSOR ALWAYS USE
ALL CORE STORAGE AVAILABLE CN AN ASSENBLY NACHINE. THE PROGRANS
DETERNINE MENORY SIZE AUTONATICALLY AT ASSEMBLY TIME AND
AOJUST TABLE PARAMETERS ACCOROINGLY. THE ASSEMBLER PRCVIOLS
FOR ASSEMBLY OF BOTH ABSCLUTE AND RELOCATABLE NAINLINE
PRCGRAMS, ANO FOR ASSEMBLY DF RELOCATABLE SUHROUTINES.
BY MEANS OF ENT AND CALL STATENENTS, PROVISION IS NAOE FOR
AUTOMATIC SYMBCLIC CROSS-REFERENCING BETWEEN PROGRANS AT
LOAD TIME. THE ASSEMBLER NAY BE USEO IO GENERATE SUBRHOUTINES
AND SUBPROGRAMS FOR FORTRAN MAIN PROGHANS. SIMILARIY,
ASSEMBLER MAIN PROGRAMS MAY CALL FORTRAN SUBROUTINES OR
SUBPROGRAMS, AS WELL AS SUBROUTINE LIBRARY AND UTILITY
ROUTINES. A CORE INAGE CONVERTER IS PROVIDEO WHICH WILL
CONVERT THE RELOCATABLE BINARY OBJECT TAPE OF A NAINLINE
ANC ALL CALLEO SUBROUTINES INTO A SINGII CORE INAGE HINARY
TAPE. THIS TAPE MAY THEN BE LOADEO WITH A CORE INAGE
LOADER WHICH HAS NO RELOCATING OR CROSS-REFERENCING ABILITIES,
THE ASSEMBLY AND COMPRESSION RATE WILL VARY WITH THE NUMBER
OF CHARACTERS PER STATENENT IN THE PRIIGRAN. IN GENERAL,
THL TOTAL PROCESSING TIME WILL BE PROPORIIONAL TC THE IOTAL

IBM Programs

CONTINUED FROM PRIOR PAGE
NUMBER OF CHARACTERS IN THAT INPUT PROGRAM, PLUS THE ASSEMBLER
OR COMPRESSOR LOAD TIME.
- THE ASSEMBLER LOAD TIME IS 5.5 MINUTES.
- THE COMPRESSOR LOAD TIME IS 3.7 MINUTES.
FOR COMPRESSING ALL BUT VERY SMALL PROGRAMS, THE COMPRESSION
RATE WILL BE ABOUT 16 STATEMENTS/MINUTE /FIGURED ON STATEMENT
SIZE OF ABOUT 26 CHARACTERS/. FOR VERY SMALL SUBROUTINES,
THE RATE WILL BE SOMEWHAT LOWER DUE TO THE EXTRA TIME REQUIRED
TO PUNCH THE LOADER OVERLAY RECORDS.
THE 1054 READS 15 CHARACTERS/SECOND AND THE 1055 PUNCHES
15 CHARACTERS/SECOND.
MINIMUM SYSTEM REQUIREMENTS- FOR PROGRAM GENERATION AND
EXECUTION -- A 4,096 WORD 1800 SYSTEM PROCESSOR-CONTROLLER...
1054 PAPER TAPE READER AND 1055 PAPER TAPE PUNCH. ENGINEERING
CHANGE LEVEL 415164.

BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
            GUIDE C26-3751.
        MACHINE READABLE - UNEDITED ASSEMBLER TAPE... UNEDITED
            COMPRESSOR TAPE... ASSEMBLER SAMPLE PROGRAM TAPE.

1800-FO-007   FORTRAN COMPILER
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1800-FO-007

    THE IBM 1800 FORTRAN COMPILER IS A CODING SYSTEM WITH A
    LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS.
    IT IS A SYSTEM DESIGNED PRIMARILY FOR SCIENTIFIC AND ENGINEERING
    COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED
    RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND
    ENGINEERS WITH A METHOD OF COMMUNICATION THAT IS MORE
    FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL
    MACHINE LANGUAGE. THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM
    STATEMENTS AS INPUT FROM CARDS, THE TYPEWRITER OR PAPER TAPE
    AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM.
    AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES,
    SUCH AS RELOCATABLE SUBROUTINES, HIGHLY COMPRESSED FORMATS AND
    FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE
    DATA CONVERSION OPERATIONS. THE FORTRAN LANGUAGE OPTIMIZES
    REDUNDANT SUBSCRIPT CALCULATIONS TO PRODUCE AN EFFICIENT
    OBJECT PROGRAM. THE FORTRAN LANGUAGE PROVIDES A HIGH LEVEL
    OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE
    REQUIREMENTS.
    MINIMUM SYSTEM REQUIREMENTS- FOR COMPILATION -- A 4,096 WORD
    1800 SYSTEM PROCESSOR-CONTROLLER... 1816 PRINTER-KEYBOARD
    OR 1053 PRINTER OR 1443 PRINTER... 1442 CARD READ PUNCH MODEL 6
    OR 7 AND ENGINEERING CHANGE LEVEL 415164.

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
            GUIDE C26-3751.
        MACHINE READABLE - UNEDITED COMPILER DECK... FORTRAN
            COMPILER EDITOR... FORTRAN SAMPLE PROBLEM.

1800-FO-008   FORTRAN COMPILER
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1800-FO-008

    THE IBM 1800 FORTRAN COMPILER IS A CODING SYSTEM WITH A
    LANGUAGE THAT CLOSELY RESEMBLES THE LANGUAGE OF MATHEMATICS.
    IT IS A SYSTEM DESIGNED PRIMARILY FOR SCIENTIFIC AND ENGINEERING
    COMPUTATIONS. SINCE THIS SYSTEM IS ESSENTIALLY PROBLEM-ORIENTED
    RATHER THAN MACHINE-ORIENTED, IT PROVIDES SCIENTISTS AND
    ENGINEERS WITH A METHOD OF COMMUNICATION THAT IS MORE
    FAMILIAR, EASIER TO LEARN, AND EASIER TO USE THAN ACTUAL
    MACHINE LANGUAGE. THE FORTRAN PROCESSOR ACCEPTS SOURCE PROGRAM
    STATEMENTS AS INPUT FROM CARDS, THE TYPEWRITER OR PAPER TAPE
    AND PRODUCES, AS OUTPUT, A MACHINE LANGUAGE PROGRAM.
    AT OBJECT TIME, THE SYSTEM UTILIZES ADVANCED TECHNIQUES,
    SUCH AS RELOCATABLE SUBROUTINES, HIGHLY COMPRESSED FORMATS AND
    FLEXIBLE INPUT AND OUTPUT COMMAND STRUCTURES WHICH FACILITATE
    DATA CONVERSION OPERATIONS. THE FORTRAN LANGUAGE OPTIMIZES
    REDUNDANT SUBSCRIPT CALCULATIONS TO PRODUCE AN EFFICIENT
    OBJECT PROGRAM. THE FORTRAN LANGUAGE PROVIDES A HIGH LEVEL
    OF LANGUAGE POWER AND FLEXIBILITY WITH MINIMAL MACHINE
    REQUIREMENTS.
    MINIMUM SYSTEM REQUIREMENTS- FOR COMPILATION -- A 4,096 WORD
    1800 SYSTEM PROCESSOR-CONTROLLER... 1054 PAPER TAPE READER
    AND... 1055 PAPER TAPE PUNCH. ENGINEERING CHANGE LEVEL 415164.

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
            GUIDE C26-3751.
        MACHINE READABLE - UNEDITED TAPES FOR INPUT PHASE FOR
            1816/1053... AND FOR 1443... PART 2 OF FORTRAN COMPILER
            FOR 1816/1053... AND FOR 1443... FORTRAN COMPILER
            EDITOR TAPE... FORTRAN SAMPLE PROGRAM TAPE.

1800-LM-003   SUBROUTINE LIBRARY
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1800-LM-003

    THE IBM 1800 SUBROUTINE LIBRARY PROVIDES ARITHMETIC,
    FUNCTIONAL, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP
    SUBROUTINES FOR USE BY OBJECT PROGRAM GENERATED BY THE
    1800 ASSEMBLER OF THE 1800 FORTRAN LANGUAGE. THE FLOATING POINT
    SUBROUTINES IN THE 1800 SUBROUTINE LIBRARY OFFER TWO RANGES
    OF PRECISION- STANDARD PRECISION AND EXTENDED PRECISION.
    THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION., THE EXTENDED
    RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES
    INCLUDE FLOATING-POINT, FIXED-POINT, SPECIAL FUNCTION,
    CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES
    ARE USED BY FORTRAN LANGUAGE OR ASSEMBLER OBJECT PROGRAM TO
    PERFORM FLOATING-POINT, FIXED-POINT ARITHMETIC, AND FUNCTIONAL
    OPERATIONS., THE CONVERSION OF DATA FROM ONE I/O CODE TO
    ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED
    TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS
    FOR DEBUGGING PURPOSES.
    MINIMUM SYSTEM REQUIREMENTS- AN 1800 SYSTEM WITH AN 1801 OR 1802
    PROCESSOR-CONTROLLER WITH 4,096 WORDS OF CORE STORAGE AND
    APPLICABLE I/O EQUIPMENT IS REQUIRED FOR EXECUTION OF THE
    SUBROUTINES. ENGINEERING CHANGE LEVEL 415164. THE I/O SUPPORTED
    DEVICES ARE- 2401/2402 MAGNETIC TAPE UNIT... 1054 PAPER TAPE
    PUNCH... 1443 PRINTER... 1627 PLOTTER... 2310 DISK FILE...
    ANALOG INPUT... DIGITAL INPUT... ANALOG/DIGITAL OUTPUT...
    1816/1053 KEYBOARD-PRINTER.

CONTINUED FROM PRIOR COLUMN--

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
            GUIDE C26-3751.
        MACHINE READABLE - STANDARD AND EXTEND PRECISION ONE AND TWO
            WORD CALLS DECKS... COMMON ONE AND TWO WORD CALLS
            DECKS... EOD1 RECORDS... EOD2 RECORDS... /UNEDITED/.
            DUMP BC SUBROUTINES DECK... ISS ROUTINES /UNEDITED/...
            COMMON 1 WORD CALLS AND CONVERSION ROUTINES WHICH MUST
            FOLLOW ISS ROUTINES... EDITOR FOR SUBROUTINE DECKS
            DUMP BC UTILITY PROGRAM AND THE ISS ROUTINES DECK.

1800-LM-004   SUBROUTINE LIBRARY
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1800-LM-004

    THE IBM 1800 SUBROUTINE LIBRARY PROVIDES ARITHMETIC,
    FUNCTIONAL, CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP
    SUBROUTINES FOR USE BY OBJECT PROGRAM GENERATED BY THE
    1800 ASSEMBLER OF THE 1800 FORTRAN LANGUAGE. THE FLOATING POINT
    SUBROUTINES IN THE 1800 SUBROUTINE LIBRARY OFFER TWO RANGES
    OF PRECISION- STANDARD PRECISION AND EXTENDED PRECISION.
    THE STANDARD RANGE PROVIDES 23 BITS OF PRECISION., THE EXTENDED
    RANGE PROVIDES UP TO 31 BITS OF PRECISION. THE SUBROUTINES
    INCLUDE FLOATING-POINT, FIXED-POINT, SPECIAL FUNCTION,
    CODE CONVERSION, I/O CONTROL AND SELECTIVE DUMP. THE SUBROUTINES
    ARE USED BY FORTRAN LANGUAGE OR ASSEMBLER OBJECT PROGRAM TO
    PERFORM FLOATING-POINT, FIXED-POINT ARITHMETIC, AND FUNCTIONAL
    OPERATIONS., THE CONVERSION OF DATA FROM ONE I/O CODE TO
    ANOTHER., THE CONTROL OF I/O ACTIVITY ON THE DEVICES ATTACHED
    TO THE SYSTEM., AND THE SELECTIVE DUMPING OF MEMORY AREAS
    FOR DEBUGGING PURPOSES.
    MINIMUM SYSTEM REQUIREMENTS- AN 1800 SYSTEM WITH AN 1801 OR 1802
    PROCESSOR-CONTROLLER WITH 4,096 WORDS OF CORE STORAGE AND
    APPLICABLE I/O EQUIPMENT IS REQUIRED FOR EXECUTION OF THE
    SUBROUTINES. ENGINEERING CHANGE LEVEL 415164. THE I/O SUPPORTED
    DEVICES ARE- 2401/2402 MAGNETIC TAPE UNIT... 1054 PAPER TAPE
    READER... 1055 PAPER TAPE PUNCH... 1443 PRINTER...
    1627 PLOTTER... 2310 DISK FILE... ANALOG INPUT...
    DIGITAL INPUT... ANALOG/DIGITAL OUTPUT...
    1816/1053 KEYBOARD-PRINTER.

    BASIC PROGRAM MATERIAL -
        DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
            GUIDE C26-3751.
        MACHINE READABLE - STANDARD AND EXTEND PRECISION ONE AND TWO
            WORD CALLS TAPES... COMMON ONE AND TWO WORD CALLS
            TAPES... EOD1 RECORDS... EOD2 RECORDS... /UNEDITED/
            DUMP BC SUBROUTINES TAPE... ISS ROUTINES WITH EOD2
            RECORDS /UNEDITED/... COMMON 1 WORD CALLS AND CONVERSION
            ROUTINES... EDITOR SUBROUTINE FOR THE DUMP BD SUBROUTINES
            TAPE AND THE ISS ROUTINES WITH EOD2 RECORDS.

1800-OS-001   IBM 1800 TIME-SHARING
EXECUTIVE SYSTEM /TSX-PHASE 1/
    ORDER THROUGH LOCAL IBM BRANCH OFFICE
    SPECIFY FILE NUMBER 1800-OS-001

    THE IBM 1800 TIME-SHARING EXECUTIVE SYSTEM /TSX-PHASE 1/
    IS A SELF-CONTAINED OPERATING SYSTEM TO BE USED ON AN
    1800 DATA ACQUISITION AND CONTROL COMPUTER FOR PROCESS
    CONTROL AND DATA ACQUISITION PROGRAM SUPERVISION.
    THE IBM 1800 TSX IS A REAL-TIME PROGRAMMING SYSTEM THAT
    AFFORDS THE USER A CONVENIENT MEANS OF GENERATING AND USING
    A COMPLETE PROCESS CONTROL OR DATA ACQUISITION SYSTEM.
    THE SYSTEM PROGRAMS PROVIDED ARE-
    -- ASSEMBLER PROGRAM-
        THE ASSEMBLER IS A DISK ORIENTED SYMBOLIC ASSEMBLY
        PROGRAM THAT TRANSLATES PROGRAMS WRITTEN IN SYMBOLIC
        LANGUAGE INTO MACHINE LANGUAGE. BASICALLY, IT IS A
        ONE-FOR-ONE TYPE ASSEMBLY PROGRAM. PROVISION IS ALSO
        INCLUDED FOR THE USER TO EASILY MAKE USE OF INPUT/OUTPUT,
        CONVERSION, AND ARITHMETIC SUBROUTINES THAT ARE A
        PART OF THE SUBROUTINE LIBRARY.
    - FORTRAN COMPILER PROGRAM-
        THE FORTRAN COMPILER IS A DISK ORIENTED PROGRAM.
        IT TRANSLATES PROGRAMS WRITTEN IN THE FORTRAN LANGUAGE
        INTO MACHINE LANGUAGE AND AUTOMATICALLY PROVIDES FOR
        CALLING THE NECESSARY ARITHMETIC, FUNCTIONAL, CONVERSION,
        AND INPUT/OUTPUT SUBROUTINES.
    - DISK UTILITY PROGRAM /GUP/-
        GUP IS A SET OF ROUTINES DESIGNED TO AID THE USER IN
        PERFORMING THE FUNCTIONS OF DISK MAINTENANCE. THAT IS,
        IT IS CAPABLE OF STORING, DELETING, AND OUTPUTTING
        USERS PROGRAMS, DEFINING SYSTEM AND MACHINE PARAMETERS,
        AND ALSO MAINTAINING COMMUNICATIONS AREAS.
    - NONPROCESS SUPERVISOR-
        THIS PROGRAM SUPERVISES ALL NON-PROCESS MONITOR OPERATIONS.
        IT DECODES THE MONITOR CONTROL RECORDS IN THE STACKED
        INPUT FOR NONPROCESS JOBS AND CALLS THE PROPER MONITOR
        PROGRAM TO PERFORM THE DESIRED OPERATION. THE SUPERVISOR
        PROVIDES CONTINUOUS PROCESSOR-CONTROLLER OPERATION
        DURING A SEQUENCE OF JOBS THAT MIGHT OTHERWISE INVOLVE
        SEVERAL INDEPENDENT PROGRAMMING SYSTEMS. IT ALSO DIRECTS
        THE TRANSFER OF CONTROL BETWEEN THE MONITOR PROGRAMS
        AND THE USERS PROGRAMS.
    - PROCESS SUPERVISOR-
        THE PROCESS SUPERVISOR CONTROLS EXECUTION OF PROCESS
        PROGRAMS. IT CONSISTS OF THE SKELETON EXECUTIVE,
        ERROR DECISION PROGRAMS, AND CERTAIN OTHER ON-LINE
        SPECIAL PURPOSE START-UP AND ANALYSIS ROUTINES.
        THE SKELETON EXECUTIVE IS BUILT UP FROM ROUTINES THE
        USER HAS ASSEMBLED AND COMPILED. MANY DIFFERENT OPTIONS
        MAY BE SPECIFIED USING EQUATE STATEMENTS WHEN THESE
        ROUTINES ARE ASSEMBLED. THE USER MAY INCLUDE FREQUENTLY
        CALLED SUBROUTINES AND HIGH PRIORITY INTERRUPT ROUTINES
        IN THE SKELETON. THE CONTROL OF TIMERS AND THE
        SCHEDULING OF CORE LOADS AND INTERRUPT ROUTINES ARE
        HANDLED BY ROUTINES SUPPLIED BY IBM.

    THE EFFICIENCIES LISTED IN THE FOLLOWING SECTIONS VARY
    DEPENDING ON THE MACHINE CONFIGURATION, DISK AND CORE LAYOUT,
    AND THE USER PROGRAM SIZE AND TYPE. THE IBM 1800 TSX PROGRAMS
    HAVE THE FOLLOWING APPROXIMATE CORE STORAGE AND EXECUTION SPEEDS-
    - ASSEMBLER-
        CORE STORAGE- MINIMUM 3692 WORDS AT THE HIGH END OF CORE.
        DISK STORAGE- 41 SECTORS.
        SAMPLE SPEEDS-
            WITH 1442 MODEL 7 - NO LISTING.   320 CDS/MIN
                               - 1443 /MOD 1/ LISTING   103 CDS/MIN
                                 /52 CHAR. SET/.
                               - 1443 /MOD 2/ LISTING   140 CDS/MIN

IBM Programs

CONTINUED FROM PRIOR PAGE--

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                           /52 CHAR. SET/.
                           - 1053                      17 CDS/MIN
          WITH 1442 MODEL 6 - NO LISTING.             250 CDS/MIN
                           - 1443 /MOD 1/ LISTING      95 CDS/MIN
                             /52 CHAR. SET/.
                           - 1443 /MOD 2/ LISTING     125 CDS/MIN
                             /52 CHAR. SET/.
                           - 1053                      16 CDS/MIN
     - FORTRAN COMPILER-
          CORE STORAGE- MINIMUM 3692 WORDS AT THE HIGH END OF CORE.
          DISK STORAGE- 104 SECTORS.
          SAMPLE SPEEDS- ASSUMING A 150 STATEMENT PROGRAM-
               WITH LISTINGS AND WITHOUT PUNCHING      47 STMTS/MIN
               WITH LISTINGS AND WITH PUNCHING         38 STMTS/MIN
               /ASSUME 50 CDS PCH/.
     - DISK UTILITY PROGRAM-
          CORE STORAGE- 3692 WORDS AT THE HIGH END OF CORE.
          DISK STORAGE- 65 SECTORS.
          SPEED-
               THE STORE OPERATION VARIES IN SPEED DEPENDING ON
               THE SIZE OF THE PROGRAM AND THE NUMBER AND DISTANCE
               OF THE DISK ARM MOVEMENTS NEEDED. NORMALLY, AN
               ASSEMBLED PROGRAM WILL BE STORED IN 15 OR 20 SECONDS
               AFTER THE STORE CONTROL CARD IS READ BY DUP.
               OTHER DUP OPERATIONS WILL NOT BE PERFORMED OFTEN IN
               MOST 1800 INSTALLATIONS, SO THE TIME THEY REQUIRE IS
               NOT SIGNIFICANT TO THE TOTAL USE OF THE 1800.
     - NONPROCESS SUPERVISOR /WITH CORE LOAD BUILDER/.
          CORE STORAGE- 3692 AT THE HIGH END OF CORE.
          DISK STORAGE- 17 SECTORS.
          SPEED-
               THE CONTROL CARD ANALYZER OPERATES AT CARD READ SPEED
               FOR MOST CONTROL CARDS. THE CORE LOAD BUILDER
               REQUIRES FROM SEVERAL SECONDS TO ABOUT THIRTY SECONDS
               UNDER WORST CONDITIONS. THE NORMAL TIME FOR AN 8K
               CORE LOAD IS 7 OR 8 SECONDS.
     - PROCESS SUPERVISOR-
          CORE STORAGE-
               MINIMUM SYSTEM /8K/ MUST PROVIDE 4500 WORDS FOR THE
               IN-CORE SKELETON IF THAT SKELETON IS TO BE USED
               OFF-LINE WITH THE NONPROCESS MONITOR. /THIS MEANS
               THAT 3692 WORDS WILL BE AVAILABLE ABOVE THE SKELETON
               FOR THE NONPROCESS MONITOR/. IF A SEPARATE SKELETON
               IS USED FOR OFF-LINE WORK, THE ON-LINE SKELETON
               MAY BE 5692 WORDS. /THIS LEAVES 2500 WORDS FOR
               ERROR DECISION PROGRAMS AND THE COLD START ROUTINE
               AT THE HIGH END OF CORE STORAGE/. THE MAXIMUM SIZE
               OF THE SKELETON IS ALWAYS DETERMINED BY THE BALANCE
               OF CORE STORAGE ABOVE THE SKELETON -- 3692 MINIMUM
               FOR NON-PROCESS MONITOR USE OR 2500 MINIMUM FOR ERROR
               DECISION PROGRAM AND COLD START USE.
          DISK STORAGE- 46 TO 131 SECTORS.
          SPEED-
               THE EXECUTION TIME OF PROCESS CORE LOADS IS DEPENDENT ON
               WHAT THEY HAVE BEEN PROGRAMMED TO DO. THE READING
               OF CORE LOADS BY THE PROCESS SUPERVISOR IS DONE
               WITH DISK ADDRESSES THAT ARE IN CORE WHEN THE NEW
               CORE LOAD IS CALLED. ALL PROCESS CORE LOADS ARE
               IN CORE IMAGE FORMAT AND ARE OBTAINED AT DISK READ
               SPEED. INTERRUPTS MAY BE PERMANENTLY IN CORE WITH
               THE SKELETON, ON DISK AS INTERRUPT CORE LOADS, OR IN
               CORE WITH MAINLINE CORE LOADS. SKELETON INTERRUPT
               ROUTINES ARE RESPONDED TO IMMEDIATELY. THE RESPONSE
               TIME OF A MAINLINE INTERRUPT ROUTINE IS THE SAME AS
               THAT OF A SKELETON INTERRUPT ROUTINE ONLY IF THE
               MAINLINE CORE LOAD CONTAINING THE INTERRUPT ROUTINE
               IS IN CORE WHEN THE INTERRUPT OCCURS. THE INTERRUPT
               CORE LOAD RESPONSE TIME DEPENDS ON THE SIZE OF THE
               CORE-LOAD AND DISK LAYOUT. IT IS THEREFORE CONSIDERABLY
               SLOWER THAN THE SKELETON OR MAINLINE CORE LOAD
               INTERRUPTS. ERROR DECISIONS PROGRAMS ARE READ INTO
               CORE AFTER SAVING 1800 WORDS OF CORE FOR THEIR RESIDENTS.
               IF A DUMP TO DISK IS INCLUDED AS AN ERROR DECISION
               OPTION, THE DUMP WILL WRITE ALL OF CORE TO DISK.
               THESE OPERATIONS PROCEED AT DISK READ-WRITE SPEED.

     MINIMUM SYSTEM CONFIGURATION- THE SYSTEM REQUIRES AN IBM 1801
     OR 1802 PROCESSOR-CONTROLLER /EC LEVEL NO. 415164/ WITH
     8K OF CORE STORAGE, ONE 2310 DISK STORAGE DRIVE, A 1053 PRINTER
     OR 1443 PRINTER OR 1816 PRINTER-KEYBOARD /PRINTER PORTION ONLY/,
     AND A 1442 CARD/READ PUNCH.

     BASIC PROGRAM MATERIAL -
          DOCUMENTATION - PROGRAM MATERIAL LIST... SYSTEM
               SPECIFICATIONS, C26-5990...OPERATING PROCEDURES, C26-3754
          MACHINE READABLE - TWENTY-FOUR OBJECT DECKS /TASK, SYSTEM
               LOADER, ASSIGNMENT CARDS, LET, DISK COMMUNICATION,
               BOOTSTRAP LOADER, SUPERVISOR, CORE LOAD BUILDER, COLD
               START, DISK UTILITIES, ASSEMBLER, FORTRAN, ERROR PROGS,
               TSX MISCELLANEOUS SUBROUTINES, TSX ARITHMETICS AND
               FUNCTIONALS, TSX CONVERSION SUBROUTINES, TSX FORTRAN I/O
               SUBROUTINES, TSX IOCS SUBROUTINES, SKELETON BUILDER, TASK
               CARD TO DISK, TASK DISK TO CARD, TASK DISK PATCH, TASK
               DISK DUPLICATION, TASK DISK LOAD FOR OFF-LINE SYSTEM/...
               THREE SOURCE DECKS /SYSTEM DIRECTOR, TASK, SAMPLE
               PROBLEM/.
```

1800-LT-001   UTILITY ROUTINES
     ORDER THROUGH LOCAL IBM BRANCH OFFICE
     SPECIFY FILE NUMBER 1800-LT-001

```
     THESE PROGRAMS WILL MAKE IT POSSIBLE TO PROGRAM THE 1800 IN
     A WIDE RANGE OF DATA ACQUISITION AND REAL-TIME CONTROL
     APPLICATIONS. THE UTILITY PROGRAMS INCLUDE- /1/ AN INPUT/OUTPUT
     ROUTINE WHICH ACCEPTS DATA FROM ONE OF THREE MEDIA /CARD, PAPER
     TAPE AND MAGNETIC TAPE/ AND OUTPUTS DATA TO ONE OF TWO OF FIVE
     OUTPUT DEVICES /CARD, PAPER TAPE, MAGNETIC TAPE, TYPEWRITER
     AND PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIRED, ONE MUST
     BE A PRINT OPTION /1053 OR 1443 PRINTER/. /2/ DUMP ROUTINES
     WHICH PERMIT THE USER TO DUMP ANY AREA OF MEMORY., OUTPUT
     CAN BE OBTAINED ON CARDS, TYPEWRITER, PRINTER OR MAGNETIC TAPE.
     /3/ LOADER ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER,
     CORE IMAGE LOADER.
     THESE ROUTINES PROVIDE THE PROGRAMMER WITH A VERSATILE TOOL
     FOR TRANSFERRING DATA FROM ONE MEDIUM TO ANOTHER AND ALSO
     FOR PERFORMING THE REPETITIVE UTILITY FUNCTIONS NEEDED DAILY
     FOR MOST DATA PROCESSING INSTALLATIONS.
     MINIMUM SYSTEM REQUIREMENTS- A 4096 WORD 1800 SYSTEM
     PROCESSOR-CONTROLLER... 1053 PRINTER... 1442 CARD READ PUNCH
     MODEL 6 OR 7... ENGINEERING CHANGE LEVEL 415164.
```

CONTINUED FROM PRIOR COLUMN--

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     BASIC PROGRAM MATERIAL -
          DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
               GUIDE C26-3751.
          MACHINE READABLE - 19 UTILITY DECKS.
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1800-UT-002   UTILITY ROUTINES
     ORDER THROUGH LOCAL IBM BRANCH OFFICE
     SPECIFY FILE NUMBER 1800-UT-002

```
     THESE PROGRAMS WILL MAKE IT POSSIBLE TO PROGRAM THE 1800 IN
     A WIDE RANGE OF DATA ACQUISITION AND REAL-TIME CONTROL
     APPLICATIONS. THE UTILITY PROGRAMS INCLUDE- /1/ AN INPUT/OUTPUT
     ROUTINE WHICH ACCEPTS DATA FROM ONE OF THREE MEDIA /CARD, PAPER
     TAPE AND MAGNETIC TAPE/ AND OUTPUTS DATA TO ONE OF TWO OF FIVE
     OUTPUT DEVICES /CARD, PAPER TAPE, MAGNETIC TAPE, TYPEWRITER
     AND PRINTER/. WHEN TWO OUTPUT DEVICES ARE REQUIRED, ONE MUST
     BE A PRINT OPTION /1053 OR 1443 PRINTER/. /2/ DUMP ROUTINES
     WHICH PERMIT THE USER TO DUMP ANY AREA OF MEMORY., OUTPUT
     CAN BE OBTAINED ON CARDS, TYPEWRITER, PRINTER OR MAGNETIC TAPE.
     /3/ LOADER ROUTINES - RELOCATING LOADER, CORE IMAGE CONVERTER,
     CORE IMAGE LOADER.
     THESE ROUTINES PROVIDE THE PROGRAMMER WITH A VERSATILE TOOL
     FOR TRANSFERRING DATA FROM ONE MEDIUM TO ANOTHER AND ALSO
     FOR PERFORMING THE REPETITIVE UTILITY FUNCTIONS NEEDED DAILY
     FOR MOST DATA PROCESSING INSTALLATIONS.
     MINIMUM SYSTEM REQUIREMENTS- A 4096 WORD 1800 SYSTEM
     PROCESSOR-CONTROLLER... 1053 PRINTER... 1055 PAPER TAPE READER
     AND 1055 PAPER TAPE PUNCH. ENGINEERING CHANGE LEVEL 415164.

     BASIC PROGRAM MATERIAL -
          DOCUMENTATION - PROGRAM MATERIAL LIST... OPERATORS
               GUIDE C26-3751.
          MACHINE READABLE - 18 UTILITY TAPES.
```

1130

1130-00.0.003   MODIFICATIONS TO THE 1130
MONITCR SYSTEM
        AVAILABLE 3RO QUARTER 1966.
        SPECIFY FILE NUMBER 1130-00.0.003

    AUTHOR...MRS. J.O. SILENCE

    OIRECT INQUIRIES TO..
            MRS. J.O. SILENCE,ALLISON OIV.,GMC,PLANT B,OEPT. 8895,
            INOIANAPOLIS, INO.

            VARIOUS SUBROUTINES WERE MOOIFIEO TO AFFECT CHANGES IN OROER
            TO ACQUIRE AN ,,OPEN SHOP,, BATCH TYPE OPERATION. CHANGES WERE
            MADE IN AREAS CONCERNING TFE SINGLE HCPPER, CARRIAGE CONTRCL,
            EXECUTION ERROR MESSAGES, ANO NUMERIC FORMATTEO INPUT. AN
            1130 CARO SYSTEM IS REQUIREO. PROGRAMMEO IN- 1130 FORTRAN
            ANO 1130 ASSEMBLER ANO IS A SUBROUTINE USEO WITH 1130 FORTRAN
            ANO ASSEMBLER. THE SOURCE OECK IS OPTIONAL MATERIAL ANO
            MUST BE SPECIFICALLY REQUESTEO ON THE OROER CARO.

1130-00.1.001   ORAW ANO PLOT SUBROUTINES
        AVAILABLE 4TH QUARTER 1966.
        SPECIFY FILE NUMBER 1130-00.1.C01

    AUTHOR...MR. B.F. MAYOFF

    OIRECT INQUIRIES TO..
            MR. B.F. MAYOFF,IBM CORP.,BO E. LAKE ST.,CHICAGO, ILL.

            ORAW IS A GENERALIZEO SUBROUTINE FOR PLOTTING THE SMCCTHEST
            STRAIGHT LINE BETWEEN TWO POINTS. WRITTEN IN 1130 SYMBCLIC
            ASSEMBLY PROGRAM LANGUAGE, IT REQUIRES AS PARAMETERS THE
            CCCRDINATES OF THE CURRENT PEN LOCATION, P SUB 1 ANO THOSE CF THE
            SECONO POINT, P SUB 2. ORAW MAY BE USEO BY FORTRAN CR SAP
            MAINLINE PROGRAMS ANO IN TURN CALLS THE SUBROUTINE PLOT. PLCT
            IS A BASIC SUBRCUTINE WHICH PROVIOES THE PROGRAMMER WITH A
            SIMPLE MEANS OF CONTROLLING THE BASIC 1627 PLOTTER FUNCTIONS.
            REQUIRING AS PARAMETERS THE OESIREO PLOTTER FUNCTION ANO THE
            NUMBER OF TIMES TO REPEAT THE FUNCTION, IT CAN BE OF GREAT USE
            TC THE FORTRAN PROGRAMMER. PLOT USES THE IBM LIBRARY
            SUBRCUTINE PLOT1. MACHINE CONFIGURATION- BASIC 1130 WITH
            APPRCPRIATE I/C EOUIPMENT.
            THIS THE CARO VERSICN OF 00.I.CC2

1130-00.1.002   ORAW ANO PLOT SUBROUTINES
        AVAILABLE 4TH OUARTER 1966.
        SPECIFY FILE NUMBER 1130-00.I.002

    AUTHCR...MR. B.F. MAYOFF

    OIRECT INCUIRIES TO..
            MR. B.F. MAYOFF,IBM CORP.,BO E. LAKE ST.,CHICAGO, ILL.

            ORAW IS A GENERALIZEO SUBROUTINE FOR PLOTTING THE SMOOTHEST
            STRAIGHT LINE BETWEEN TWO POINTS. WRITTEN IN 1130 SYMBCLIC
            ASSEMBLY PROGRAM LANGUAGE. IT REQUIRES AS PARAMETERS THE
            CCCRDINATES OF THE CURRENT PEN LOCATION, P SUB 1 ANO THOSE CF THE
            SECONO POINT, P SUB 2. ORAW MAY BE USEO BY FORTRAN OR SAP
            MAINLINE PROGRAMS ANO IN TURN CALLS THE SUBROUTINE PLOT. PLCT
            IS A BASIC SUBROUTINE WHICH PROVIOES THE PROGRAMMER WITH A
            SIMPLE MEANS OF CONTROLLING THE BASIC 1627 PLOTTER FUNCTIONS.
            REQUIRING AS PARAMETERS THE OESIREO PLOTTER FUNCTION ANO THE
            NUMBER OF TIMES TO REPEAT THE FUNCTION, IT CAN BE OF GREAT USE
            TO THE FORTRAN PROGRAMMER. PLOT USES THE IBM LIBRARY
            SUBRCUTINE PLOT1. MACHINE CONFIGURATICN- BASIC 1130 WITH
            APPRCPRIATE I/O EQUIPMENT.
            THIS THE TAPE VERSION OF 00.I.001

1130-03.0.002   COMET COMMERCIAL SUBROUTINES
        AVAILABLE IST QUARTER 1966.
        SPECIFY FILE NUMBER 1130-C3.0.002

    AUTHCRS..J.R. HURLEY   F. MARCUS   S. PAAVOLA
            J. ZIMMERMAN

    CIRECT INQUIRIES TO..
            J.R. HURLEY,IBM CORP.,777 GRANT,OENVER, CCLO.

            THE COMET SYSTEM IS A SET OF SUBROUTINES WHICH PERMIT THE
            PRCGRAMMER TO PERFORM FREQUENTLY-REQUIREO COMMERCIAL OR
            LOGICAL FUNCTICNS IN FORTRAN WHICH WOULO OTHERWISE BE
            AWKWARO OR IMPCSSIBLE. THE SUBROUTINE SET IS MOOULAR, EACH
            SUBRCUTINE BEING INCLUCEO IN THE USERS PROGRAM ONCE ONLY
            IF IT IS REFERENCEO BY A CALL STATEMENT IN THE FORTRAN MAIN
            PROGRAM. COMET PROVIOES THESE FUNCTIONS- ZONE TESTING ANO
            INSERTING., MOVES ANO CCMPARES OF ALPHAMERIC OATA., EOITING
            EQUIVALENT TO 1401 EXTENOEO EOIT., CLEARING OF OATA AREAS.
            CCMET PACKS OATA TO MINIMIZE CORE REQUIREMENTS FOR OATA STCRAGE.
            COMET WILL RUN ON ANY IBM I130 WHICH WILL SUPPORT FORTRAN
            CCMPILATICN, ANO IS APPLICABLE TO ANY SYSTEM CONFIGURATION
            WITH SUFFICIENT CORE TO CONTAIN THE PROGRAM ANO WITH ATTACHEO
            I/C OEVICES THAT ARE REFERENCEO IN THE FORTRAN MAIN-LINE.
            STORAGE REQUIREMENTS OEPENC ON FUNCTIONS USEO. COMET IS
            WRITTEN IN I13C ASSEMBLY LANGUAGE ANO IS FURNISHEO IN CARO
            FORM FOR USE WITH CARO-ORIENTEO 1130/S. IT CAN, HOWEVER,
            BE EASILY AOAPTEO FOR USE ON PAPER TAPE CONFIGURATIONS.

1130-03.0.003   STUOENT INFORMATION SYSTEM   •N
        AVAILABLE 4TH OUARTER 1966.
        SPECIFY FILE NUMBER 1130-03.0.C03

    AUTHOR...PETER S. RHCOE

    OIRECT INQUIRIES TO..
            PETER S. RHCCE,IBM CORP.,690 N. ROBERT ST.,
            ST. PAUL, MINN. 55ICI

            THE IBM I130 STUOENT INFORMATION SYSTEM IS A GROUP OF
            PRCGRAMS TO INITIALIZE ANO UPOATE OISK FILE OATA USEO TO
            PREPARE REPORTS FOR STUOENT RECORO AOMINISTRATION IN A SMALL
            COLLEGE, JUNIOR COLLEGE, OR HIGH SCHOOL. IT IS APPLICABLE
            IN THE AREAS OF REGISTRATION, GRAOE REPORTING, COURSE OATA,
            STUOENT TRANSCRIPTS, ETC. THE STUOENT INFORMATION SYSTEM
            CAN HANOLE ON LINE UP TO 5I2 INSTRUCTORS, 204B CLASSES, ANO
            4096 STUOENT RECOROS, EACH CONTAINING AT MOST 60 COURSES.

CONTINUEO FRCM PRIOR COLUMN--
            THIS SYSTEM IS INITIALLY PROGRAMMEC TO A GENERALIZEO SCHUOL
            SITUATION. HOWEVER, IT MAY BE MOOIFIEO TC ACCOMMOOATE
            INOIVICUAL REQUIREMENTS. THE SYSTEM REOUIRES AN B192 WORD
            1130 WITH OISK, 1442 CARO REAO PUNCH, ANO 1132 PRINTER.
            THE PROGRAMS ARE WRITTEN IN ASSEMBLY LANGUAGE.

1130-05.1.001   ELECTRIC POWER SYSTEM LOAO   •N
FLOW PROGRAM
        AVAILABLE 4TH OUARTER 1966.
        SPECIFY FILE NUMBER 1130-05.1.00I

    AUTHOR...L.O. WILLIS

    OIRECT INQUIRIES TO..
            L.O. WILLIS,IBM CORP.,WRO,3424 WILSHIRE BLVO.,
            LCS ANGELES, CALIF. 90CO5

            THE PRCGRAM PRCOUCES THE RESULTS OF A PERFORMANCE CALCULATION
            ON AN ELECTRIC POWER SYSTEM UNOER LOAO. THESE RESULTS
            SPECIFICALLY INCLUCE TFE POWER ANO REACTIVE FLOWS IN
            TRANSMISSIONS LINES ANO OTHER FACILITIES. THE NOOAL ITERATIVE
            METHOO IS USEO, PROVIOING GREAT FLEXIBILITY IN PROGRESSING
            FRCM CASE TO CASE IN POWER SYSTEM PLANNING ANO OPERATING
            STUOIES. EXTENSIVE USER ORIENTEO FEATURES ARE PROVIOEO, SC
            THAT THE BUROENS OF OATA PREPARATION ANO ANSWER INTERPRETATICN
            ARE REOUCEO TO A MINIMUM.

            THE PRCGRAM IS WRITTEN IN ASSEMBLER LANGUAGE ANO USES THE
            OATA CCNVERSION SUBROUTINES, THE FLOATING POINT SUBROUTINES,
            ANO THE I/O SUBROUTINES. THE PROGRAM IS RUN UNOER I130
            MCNITOR SUPERVISION. CCNFIGURATION- CPU I131-2B /B192 WOROS
            W/OISK/, CARO REAO/PUNCH I442-6 OR 7, OUTPUT ON CONSOLE
            TYPEWRITER OR OPTIONAL PRINTER I132.

113Q-09.7.001   MULTI-LINE INTERPOLATION
ROUTINE
        AVAILABLE 3RO OUARTER 1966.
        SPECIFY FILE NUMBER I130-09.7.00I

    AUTHCR...MR. W.J. ELLIOTT

    CIRECT INCUIRIES TO..
            MRS. J. SILENCE,ALLISON OIVISION,GMC,PLANT 8,OEPT. 8895,
            INOIANAPOLIS, INO.

            THIS ROUTINE PROVIOES A METHCO FOR INTERPOLATING BETWEEN
            TABULATEO FUNCTIONS OF A SINGLE VARIABLE ANO TWO VARIABLES. THE
            METHCO EMPLOYEC IS LAGRANGE INTERPOLATION, IST THROUGH 3RO
            OEGREES, IN EITHER PRIMARY OR SECONOARY INOEPENOENT VARIABLE.
            SYSTEM REQUIREC- 1130 WITH CARO I/O ANO 1132 PRINTER.
            PRCGRAMMED IN- 1130 ASSEMBLER. THIS IS AN 1130 FORTRAN
            SUBRCUTINE.

1130-10.3.001   CPM/PERT FOR THE IBM 1130,   •N
FORTRAN COOEO, CRITICAL PATH SCHEOULING WITH PROBABILITY ANALYSIS
        AVAILABLE 4TH QUARTER 1966.
        SPECIFY FILE NUMBER 1130-IO.3.OOI

    AUTHOR...MR. J.W. BURGESON

    OIRECT INQUIRIES TO..
            MR. J.W. BURGESON,IBM CORP.,618 S. MICHIGAN,
            CHICAGO, ILL. 60605

            THE PURPOSE OF THIS PROGRAM IS TO PROCESS NETWORK SCHEOULING
            PROBLEMS. IT PROVIOES BOTH BASIC CRITICAL PATH SCHEOULING /CPM/
            ANO PROBABILITY ANALYSIS /PERT/. MOOIFICATION INSTRUCTIONS
            ARE INCLUOEO TC FACILITATE CONVERSION TO OTHER HAROWARE.
            FEATURES OF THE PROGRAM INCLUOE RANOOM NOOE NUMBERING, BOTH
            ACTIVITY-ORIENTEC ANO EVENT-ORIENTEO PERT REPORTING,
            SIMPLIFIEO COOING FOR EASE OF MOOIFICATION, MAXIMUMS OF 999
            EVENTS, I400 JOBS, MULTIPLE START ANO ENOING NOOES PERMITTEO,
            BAR CHART REPORT, OPTICNAL PRE-SET PROJECT COMPLETION OATE
            ANO A NETWORK LOOP-CATCHING ERROR ROUTINE.

1130-13.0.001   STEP-WISE MULTIPLE   •N
REGRESSION PROGRAM
        AVAILABLE 4TH QUARTER 1966.
        SPECIFY FILE NUMBER 1130-13.0.C0I

    AUTHOR...MASCN ROSENTHAL

    CIRECF INQUIRIES TO..
            MASCN ROSENTHAL,IBM CORP.,340 MARKET ST.,SAN FRANCISCO, CALIF

            THIS PROGRAM PERFORMS A STEP-WISE REGRESSION ANALYSIS ON
            UP TO 9999 SETS OF OBSERVATIONS ON ONE OEPENOENT VARIABLE
            ANO UP TO 29 EXPLANATORY VARIABLES. THE PRUGRAM ALLCWS FOR NINE
            TYPES OF ALGEBRAIC TRANSFORMATIONS OF ORIGINAL OATA.
            OUTPUT CONSISTS OF MEANS, STANOARO OEVIATIONS, SIMPLE
            CORRELATION COEFFICIENTS, ANO STEP-WISE RESULTS. STEP-WISE
            RESULTS CONSIST OF THE STANCARO ERROR OF ESFIMATE, THE MULTIPLE
            CORRELATION COEFFICIENT, F, CONSTANT TERM, ANO REGRESSION
            COEFFICIENTS ANO THEIR STANOARO OEVIATIONS, STUOENTS T/S,
            ANO BETA COEFFICIENTS. OUTPUT OF RESIOUALS IS OPTICNAL.
            THE PRCGRAM IS WRITTEN IN FORTRAN ANO REQUIRES BK ANO 1130
            MONITOR FORTRAN FEATURES FOR COMPILATION ANO EXECUTION.

1130-13.0.002   CALCULATION OF ELECTRICAL   •N
DISTRIBUTION SYSTEM FAULT CURRENTS
        AVAILABLE 4TH QUARTER 1966.
        SPECIFY FILE NUMBER I130-I3.0.002

    AUTHOR...E.P. MCLEAN, JR.

    CIRECT INQUIRIES TO..
            E.P. MCLEAN, JR.,E.P. MCLEAN ENGINEERING CO.,S. MAIN ST.,
            MCULTRIE, GA.

            THIS PROGRAM IS OESIGNEO TO COMPUTE LINE-TO-LINE, THRLE-PHASE,
            ANO LINE-TO-GROUNO MAXIMUM, AS WELL AS LINE-TO-GROUND
            MINIMUM FAULT CURRENTS ON RAOIAL OISTRIBUTION SYSTEMS.
            COMPUTATIONS UTILIZE A TABLE OF ,,R,, ANO ,,X,, VALUES FOR
            THE APPROPRIATE WIRE SIZES. THE PRUGRAM HAS ALSO PROVIOEO FCR

Contributed Programs

CONTINUED FROM PRIOR PAGE--
THE USE OF CERTAIN MIXED CONDUCTORS. IF A LINE SECTION
CONTAINS MIXED CONDUCTORS, THE MAXIMUM FAULT CURRENTS ARE
CALCULATED BASED ON THE LARGEST SIZE CONDUCTOR AND THE
MINIMUM FAULT CURRENTS ARE CALCULATED BASED ON THE SMALLER
SIZE CONDUCTORS,

THE PROGRAM WILL ACCOMMODATE UP TO 60 LINE SEGMENTS OF
SINGLE-PHASE, 46 LINE SEGMENTS OF TWO-PHASE /MUST BE IN
FIRST 40 SECTIONS COMPUTED/, AND 30 LINE SEGMENTS OF THREE PHASE
/MUST BE IN FIRST 30 SECTIONS COMPUTED/. CALCULATIONS CAN BE
MADE FOR TWO DIFFERENT TRANSFORMER SIZES AND SOURCE FAULT
CURRENT VALUES DURING THE SAME PASS. FOR INSTANCE, THE
MAXIMUM CALCULATIONS COULD BE BASED ON ZERO SOURCE IMPEDANCE
AND A TRANSFORMER CAPACITY OF 10,000 KVA WHILE, AT THE SAME TIME,
MINIMUM LINE TO GROUND CALCULATIONS COULD BE BASED ON A KNOWN
VALUE OF AVERAGE FAULT CURRENT ON THE HIGH SIDE OF THE
TRANSFORMERS AND A SMALLER TRANSFORMER CAPACITY. A FAULT
IMPEDANCE OF 40.00 OHMS HAS BEEN ASSUMED FOR MINIMUM LINE TO
GROUND FAULTS. A 4K 1130 WITH PAPER TAPE READER AND PUNCH
IS REQUIRED. PROGRAMMED IN FORTRAN.

1130-15.2.001   HEURISTIC CORRUGATOR   *N
SCHEDULING PROGRAM
     AVAILABLE 4TH QUARTER 1966.
     SPECIFY FILE NUMBER 1130-15.2.001

AUTHOR...MR. F. GUMMERSALL

DIRECT INQUIRIES TO..
     MR. F. GUMMERSALL,IBM CORP.,MONTEREY & COTTLE RDS.,
     SAN JOSE, CALIF. 95114

     THE HEURISTIC CORRUGATOR SCHEDULING PROGRAM SCHEDULES A
     BOX PLANT CORRUGATOR OR COMBINER TO PRODUCE RECTANGLES OF
     SPECIFIED DIMENSIONS GIVEN CUSTOMER ORDER REQUIREMENTS,
     CORRUGATOR PARAMETERS, AND ROLL STOCK INVENTORY. THE METHOD
     EMPLOYED IS SIMILAR TO THAT USED BY A HUMAN SCHEDULER AS
     ORDERS ARE COMBINED AND TESTED AND THE BEST ONES CHOSEN.
     THE ADVANTAGE OF THE COMPUTER PROGRAM IS THAT IT CAN TRY A LOT
     MORE COMBINATIONS IN A SHORTER PERIOD THAN THE HUMAN.
     THE PROGRAM IS IN FORTRAN TO RUN UNDER 1130 MONITOR ON AN
     8-K CARD, 1132 PRINTER AND DISK SYSTEM.

1130-16.2.001   PIER ANALYSIS
     AVAILABLE 3RD QUARTER 1966.
     SPECIFY FILE NUMBER 1130-16.2.001

AUTHOR...MR. T.T. PAI

DIRECT INQUIRIES TO..
     MR. T.T. PAI,IBM CORP.,7321 W. LAKE ST.,RIVER FOREST, ILL.

     THIS PROGRAM IS MAINLY INTENDED FOR A QUICK AND ACCURATE PIER
     ANALYSIS. THE PIER CAN HAVE TWO TO SIX COLUMNS, CANNOT HAVE
     INTERMEDIATE HINGES. OTHERWISE, THE PROGRAM WILL OPERATE
     WITHOUT ANY LIMITATIONS FOR EITHER PHYSICAL DIMENSIONS OR
     LOADING POSSIBILITIES. ANY MEMBER OR MEMBERS MAY BE PRISMATIC,
     REGULARLY HAUNCHED AND TAPERED, OR IRREGULAR. THE FOOTINGS MAY
     BE CONTINUOUS OR ISOLATED WITH A VARIABLE DEGREE OF FIXITY AT
     THE BASE OF EACH COLUMN. LOADING MAY BE THE WEIGHT OF THE
     PIER CAP, ANY VERTICAL OR HORIZONTAL FORCES, OR FORCES DUE TO
     TEMPERATURE CHANGE OR SHRINKAGE. THE PROGRAM MAY ALSO BE USED TO
     ANALYZE A ONE TO FIVE SPAN CONTINUOUS BEAM WITH OR WITHOUT
     INTEGRAL LEGS, SINCE THE WEIGHT OF ANY COLUMN OR COLUMNS MAY BE
     ZERO. LANGUAGE USED IS FORTRAN. MACHINE CONFIGURATION-
     8K 1130 WITH DISK, CARD READ AND PUNCH, AND LINE PRINTER.
     THE RUNNING SPEED IS ALMOST I/O BOUND. TWO SAMPLE PROBLEMS
     TOGETHER COST ABOUT FOUR MINUTES.

1130-16.2.002   1130 4K COGO
     AVAILABLE 4TH QUARTER 1966.
     SPECIFY FILE NUMBER 1130-16.2.002

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     THIS IS A FORTRAN LANGUAGE PROGRAM THAT SOLVES COORDINATE
     GEOMETRY PROBLEMS FOR ENGINEERS AND SURVEYORS. INPUT TO
     THE PROGRAM CONSISTS OF ALPHABETIC COMMANDS WHICH ARE
     ABBREVIATIONS OF FAMILIAR ENGINEERING TERMINOLOGY. THE PROGRAM
     ALLOWS THE ENGINEER TO BALANCE A TRAVERSE, COMPUTE A
     SUBDIVISION, CALCULATE A RIGHT-OF-WAY ETC. THE PROGRAM IS
     WRITTEN FOR A 4K 1130 MODEL II AND OPERATES UNDER THE 1130
     MONITOR SYSTEM. THE PROGRAM SUPPORTS A LARGE COORDINATE TABLE
     OF 1270 POINTS WHICH IS STORED ON DISK. THE SYSTEM PERMITS THE
     USER, WHO MAY BE UNFAMILIAR WITH COMPUTERS, TO SOLVE GEOMETRICAL
     PROBLEMS IN HIS OWN LANGUAGE ON A BASIC 1130 DISK SYSTEM.
     ADVANTAGES ARE- FREE FORMAT, LARGE COORDINATE TABLE STORED ON
     DISK, AND SMALL MACHINE REQUIREMENTS. THE METHOD IS-
     MONITOR SYSTEM CONTROLLING GEOMETRY SUBROUTINES AND DATA
     TABLES WHICH RESIDE ON DISK. THE USER MAY EASILY MODIFY OR ADD
     TO THE EXISTING PROGRAM. THE ONLY LIMITATION IS THE AMOUNT
     OF CORE STORAGE AVAILABLE. ALL THAT IS REQUIRED IS AN
     UNDERSTANDING OF THE GENERAL FLOW OF THE EXISTING PROGRAM
     AND A KNOWLEDGE OF 1130 FORTRAN.
     MACHINE CONFIGURATION- A 1131 MODEL A2 /4K WITH DISK/ WITH A
     1442 CARD READ-PUNCH MODEL 6 OR 7, OR 1134 PAPER TAPE READER
     AND 1055 PAPER TAPE PUNCH. THIS PROGRAM IS EASILY CONVERTED
     TO PAPER TAPE FOR PAPER TAPE USERS.

1130-16.2.003   RETAINING WALL DESIGN   *N
     AVAILABLE 4TH QUARTER 1966.
     SPECIFY FILE NUMBER 1130-16.2.003

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CONTINUED FROM PRIOR COLUMN--

     THE PROGRAM RETAINING WALL DESIGN WILL DESIGN SIMPLE
     RETAINING WALLS WITH A MINIMUM OF INPUT. A CHOICE IS
     OFFERED BETWEEN A PARTIAL DESIGN HOLDING A SPECIFIED TOE
     OR HEEL SIZE, OR COMPLETE DESIGN OF SECTION. OUTPUT INCLUDES
     CONCRETE DIMENSIONS AND AMOUNT OF REINFORCING REQUIRED AT
     CRITICAL LOCATIONS. ALTERNATE DESIGNS ARE PROVIDED IF SLIDING
     TEST IS NOT SUCCESSFUL.
     PROGRAM REQUIRES- 1131 CPU 8K DISK... 1132 PRINTER...
     1442 CARD READ PUNCH. PROGRAMMED IN 1130 FORTRAN.
     OPERATION IS UNDER MONITOR SYSTEM. SAMPLE PROBLEM OPERATING
     TIME- ABOUT 1 MINUTE. COMPILATION TIME - FULL LISTING -
     ABOUT 8 MINUTES.

1130-30.1.001   PAYROLL AND LABOR COST
DISTRIBUTION PACKAGE DEMONSTRATION
     AVAILABLE 4TH QUARTER 1966.
     SPECIFY FILE NUMBER 1130-30.1.001

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     THIS PACKAGE SHOWS HOW COMMERCIAL WORK CAN BE DONE ON A
     SCIENTIFIC MACHINE, USING EXCLUSIVELY FORTRAN.
     THIS PACKAGE CONSISTS OF A SET OF PROGRAMS THAT WILL-
     - ORGANIZE AND MAINTAIN EMPLOYEE FILES AND PROJECT
       /OR ACCOUNT/ FILES.
     - COMPUTE A PAYROLL, UPDATE FILES, PRINT EARNING STATEMENTS
       AND PAY CHECKS.
     - PRINT PAYROLL REGISTERS, AND A COST DISTRIBUTION REPORT.
     SINCE THIS PACKAGE IS WRITTEN PRIMARILY FOR DEMONSTRATION
     PURPOSES IT IS MADE AVAILABLE AS A SINGLE DECK OF CARDS
     /OBJECT DECKS WITH CONTROL CARDS/, WHICH CAN BE USED IN A
     LOAD AND GO OPERATION. DATA DECKS AND CONTROL CARDS FOR
     EXECUTION ARE ALSO PROVIDED. NO OPERATOR INTERVENTION
     WILL BE NECESSARY OTHER THAN THE OPTION ENTRIES THAT WILL
     BE TYPED AS INSTRUCTIONS IN CLEAR LANGUAGE ON THE CONSOLE
     TYPEWRITER.
     AS A DEMONSTRATION FEATURE, IT IS POSSIBLE, BY FLIPPING A
     SWITCH ON THE CONSOLE, TO PROCESS A PAYROLL BY MANUAL TYPEWRITER
     ENTRY, INSTEAD OF THE USUAL EMPLOYEE TIME CARD ENTRY.
     MINIMUM CONFIGURATION- 1131 8K, MOD 2 /DISK STORAGE/...
     1132 PRINTER... 1442 CARD READER.
     THE OPTIONAL MATERIAL IS THE SOURCE DECK AS SHOWN IN THE BACK
     OF THIS MANUAL.

1800

1800-23.5.001   GAS CHROMATOGRAPH MONITORING   *N
PROGRAM
     AVAILABLE 4TH QUARTER 1966.
     SPECIFY FILE NUMBER 1800-23.5.001

AUTHOR...R.O. MCCULLOUGH

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     THIS IS A GENERALIZED SET OF PROGRAMS WHICH ALLOWS THE USER
     TO MONITOR LABORATORY CHROMATOGRAPHS ON A REAL TIME BASIS
     USING AN IBM 1800. IT IS CAPABLE OF READING ANALOG VOLTAGE
     OUTPUTS FROM CHROMATOGRAPHS, CHANGING AMPLIFICATION RANGES,
     OPERATING CONTACTS, /FOR COLUMN SWITCHING AND BACKFLUSHING/,
     DETECTING PEAKS, IDENTIFYING PEAKS, CALCULATING ANALYSIS
     RESULTS, AND REPORTING THESE RESULTS ON 1053/S/ WITH MINIMUM
     LABORATORY PERSONNEL INVOLVEMENT. ALSO INCLUDED IS A SET
     OF MAINTENANCE PROGRAMS THAT ALLOW A USER TO ADD, MODIFY,
     OR DELETE CHROMATOGRAPHIC METHODS BY INPUT OF DATA CARDS
     TO THE SYSTEM INSTEAD OF REPROGRAMMING. THE REQUIRED SYSTEM
     CONFIGURATION IS AS FOLLOWS- 16K 1800 /2 OR 4 MICROSECOND/...
     ONE 2310... ONE 1442... ONE OR MORE 1053/S... DIGITAL INPUT
     POINTS... DIGITAL OUTPUT POINTS... PROCESS INTERRUPT...
     CUSTOMER MODIFIED ANALOG INPUT FEATURES... ONE OR MORE
     CUSTOMER MODIFIED 1092/S. USES 1800 TSX, FORTRAN, AND
     ASSEMBLY LANGUAGE.

1800-23.5.002   DDC DIRECT DIGIT PROCESS   *N
CONTROL
     AVAILABLE 4TH QUARTER 1966.
     SPECIFY FILE NUMBER 1800-23.5.002

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     THIS PROGRAM ALLOWS THE 1800 CONTROL AND DATA ACQUISITION
     SYSTEM TO REPLACE CONVENTIONAL ANALOG CONTROLLERS IN CONTROL
     OF A PROCESS, I.E., PERFORM DIRECT DIGITAL PROCESS CONTROL.
     OPERATOR COMMUNICATION IS ALSO IMPLEMENTED. AN 1800 CARD
     SYSTEM WITH 16K OF STORAGE, ONE 1053 PRINTER, ONE 2310 DISK FILE,
     AND SEVERAL RPQ/S, INCLUDING THE PROCESS OPERATORS CONSOLE,
     ARE REQUIRED. WRITTEN IN SYMBOLIC ASSEMBLY LANGUAGE, THE
     PROGRAM WILL RUN INDEPENDENTLY IN A DEDICATED SYSTEM.

     PROGRAM LISTINGS AND FLOWCHARTS ARE AVAILABLE ONLY ON
     MAGNETIC TAPE, AS OPTIONAL MATERIAL. THE PROGRAM LISTINGS
     CAN BE PRINTED ON A 1401 USING 1401-UT-039. THE FLOWCHARTS
     ARE PRECEDED BY A SELF-LOADING PRINT PROGRAM. THE REEL
     OF TAPE REQUIRED TO OBTAIN THE OPTIONAL PROGRAM MATERIAL
     MAY BE SUPPLIED OR ORDERED FROM YOUR IBM REPRESENTATIVE.

Contributed Programs

List of Program Deletions

ALPHABETIC KEY TO REASONS FOR REMOVAL.

A. THIS PROGRAM HAS BEEN DELETED BECAUSE OF LOW USAGE.
C. THIS PROGRAM HAS BEEN DELETED BECAUSE OF LIMITED USEFULNESS.
D. THIS PROGRAM IS OBSOLETED AND REPLACED BY FILE NUMBER --------.
E. THIS PROGRAM HAS BEEN WITHDRAWN BY THE COMMON ORGANIZATION.
F. THIS PROGRAM HAS BEEN WITHDRAWN BY THE AUTHOR.

Previous Deletions

FILE NUMBER	TITLE	REASON FOR DELETION
	1130 DELETIONS	
03.0.001	FORCOM FORTRAN COMMERCIAL SUBROUTINES	F

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